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(12) **United States Patent**
Livacich

(10) **Patent No.: US 7,828,038 B2**
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(54) **UNIVERSAL LIGHTWEIGHT PORTABLE CONCEALMENT MEANS AND METHODS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 544 days.

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(22) Filed: **Jan. 28, 2005**

(65) **Prior Publication Data**

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Related U.S. Application Data

(63) Continuation-in-part of application No. 10/161,986, filed on Jun. 4, 2002, now Pat. No. 7,100,626.

(60) Provisional application No. 60/295,956, filed on Jun. 4, 2001.

(51) **Int. Cl.**
E04H 15/58 (2006.01)

(52) **U.S. Cl.** **160/135**; 135/117

(58) **Field of Classification Search** 160/135, 160/351, 352; 135/182, 907, 99, 135, 159, 135/117, 114, 118, 120.4, 119, 901, 902; 248/156, 508, 546, 547, 530, 532, 545; 411/457, 411/458, 460, 388; 403/307, 293
See application file for complete search history.

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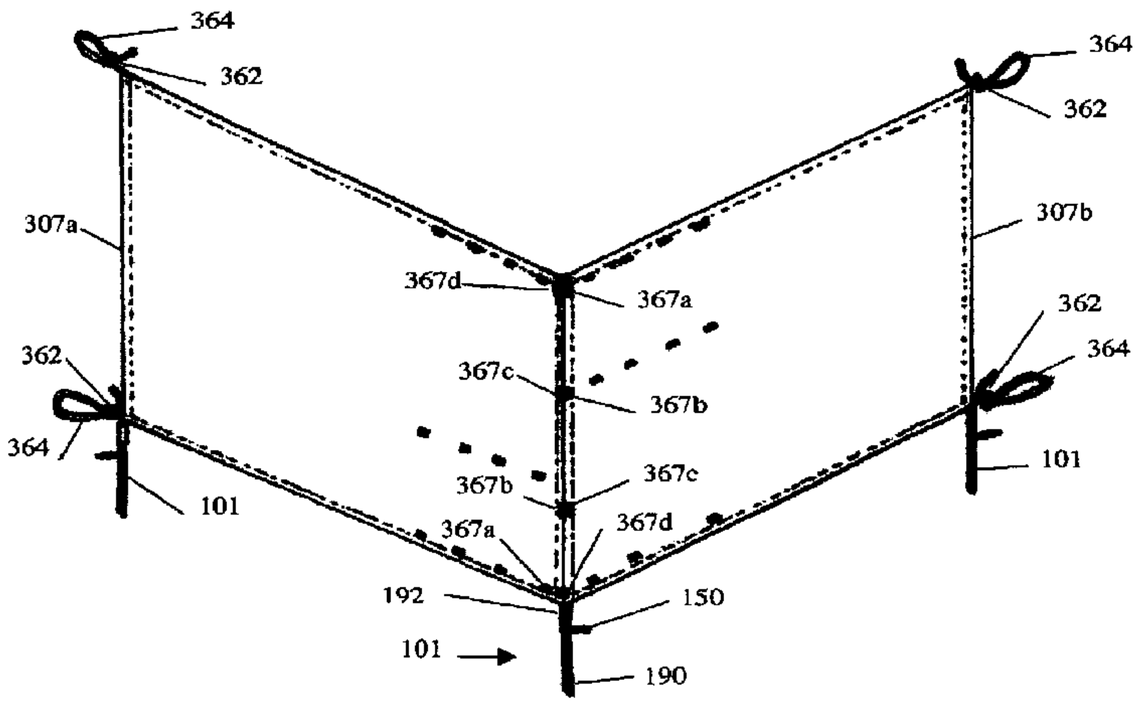
Primary Examiner—David Purol

(57) **ABSTRACT**

An easy to use, universal, simple, lightweight, compact, portable system of concealment and methods for its construction and use. The concealment system comprises a support and a curtain. The support attaches to a structure and pivots on the attachment. Various embodiments include multiple supports and multiple curtains. A method of hiding in front of a similar pattern. An alternate support may be used to form both tree blinds and ground blinds.

6 Claims, 38 Drawing Sheets



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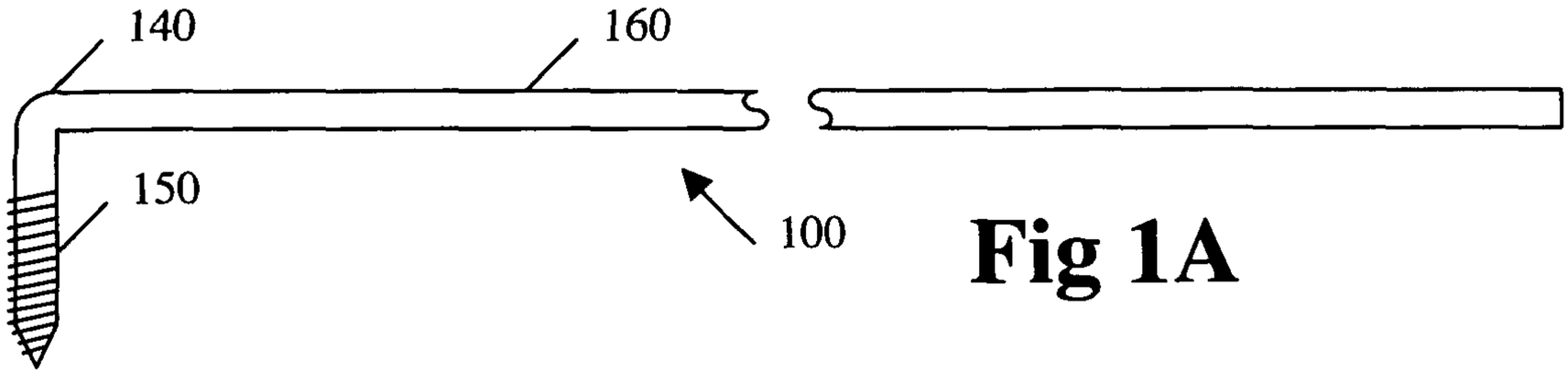

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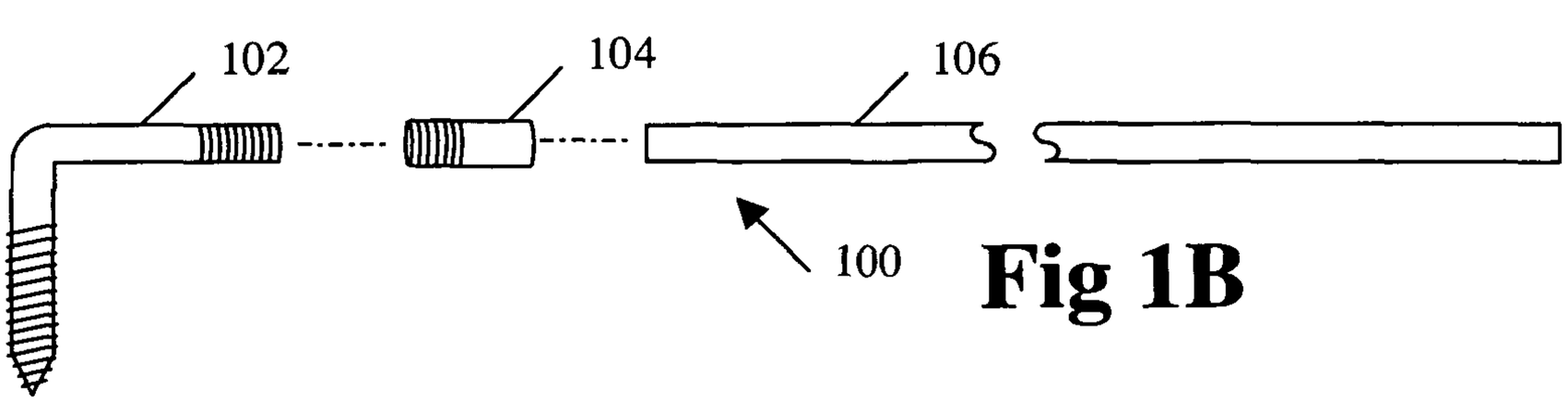

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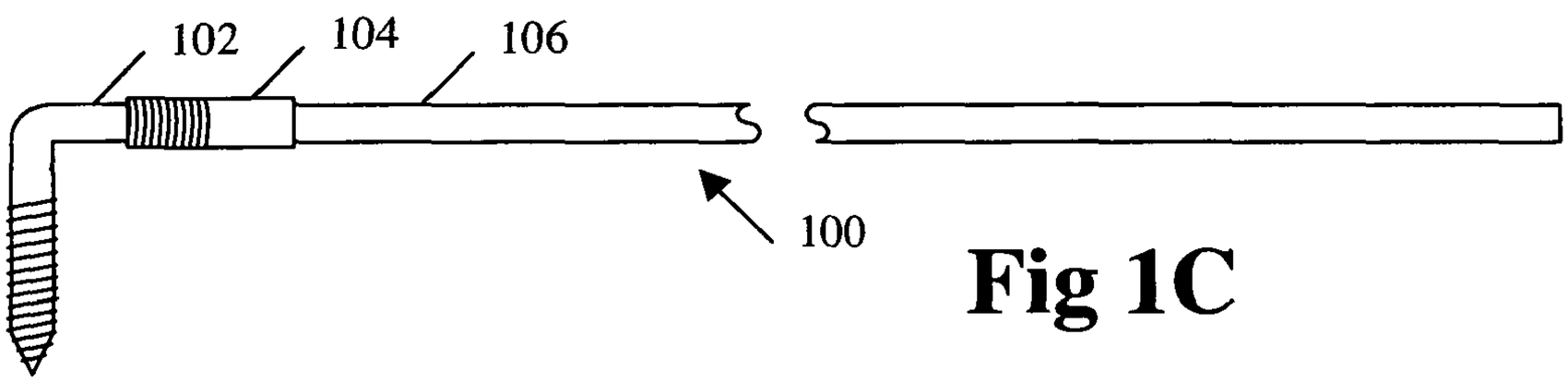

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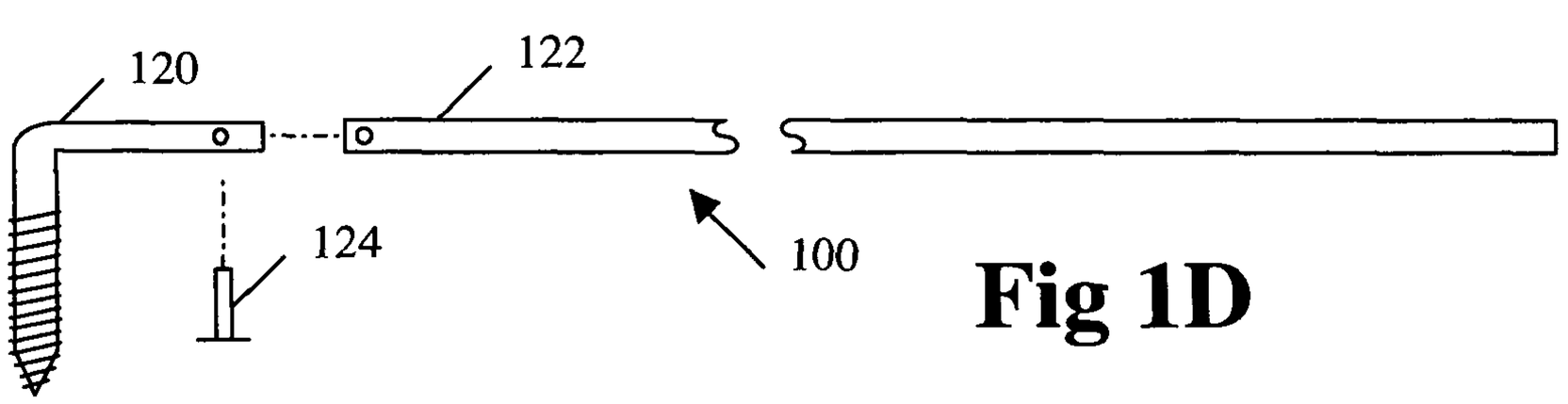

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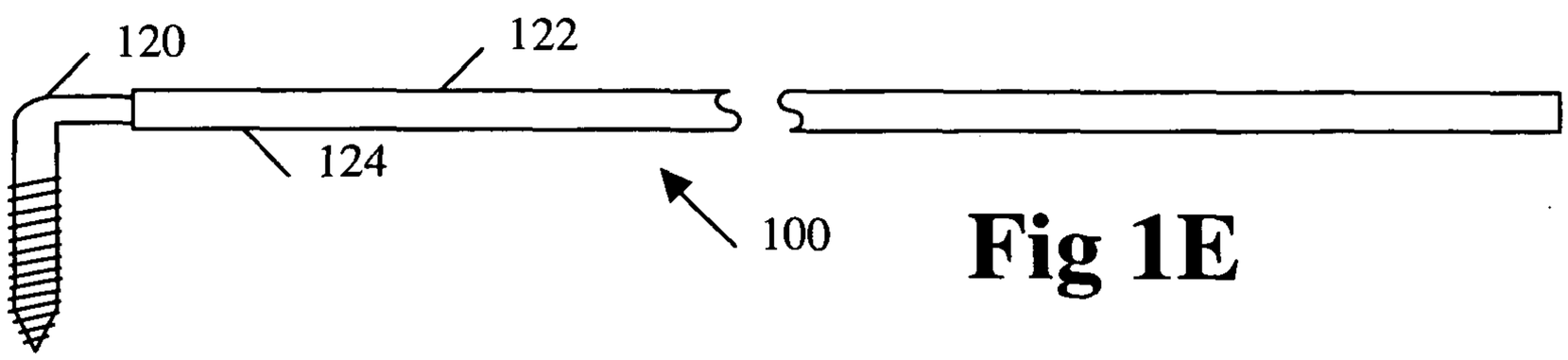

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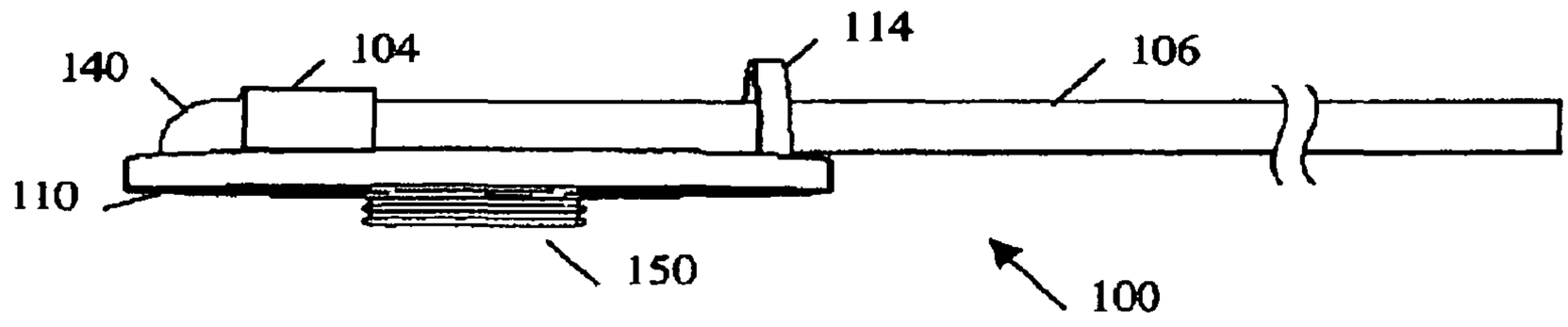

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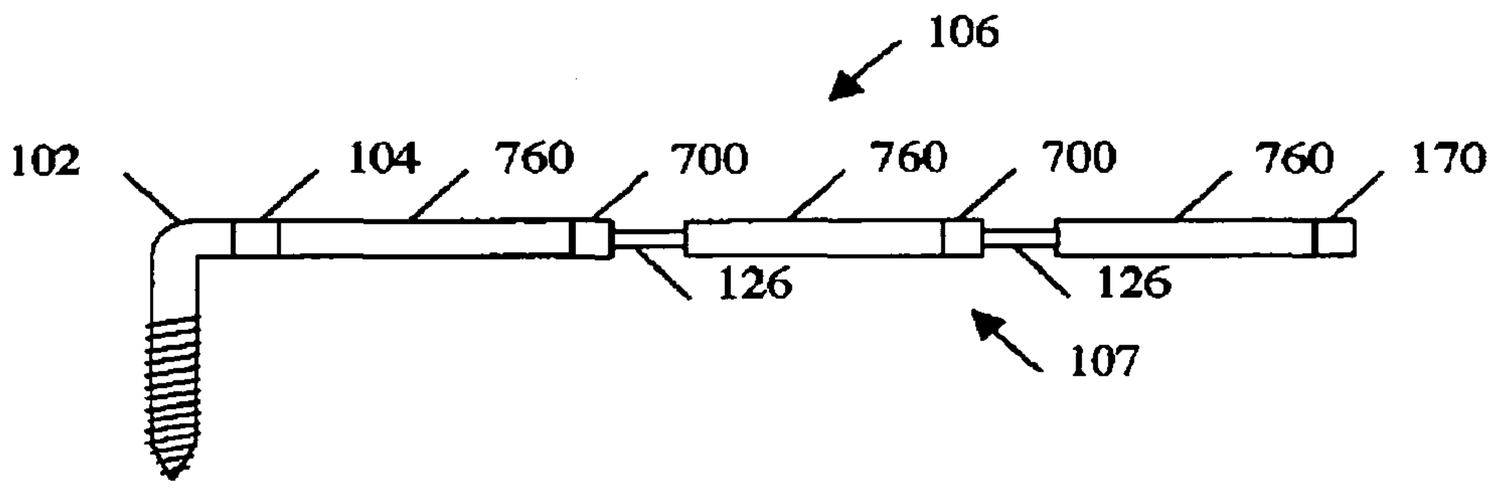

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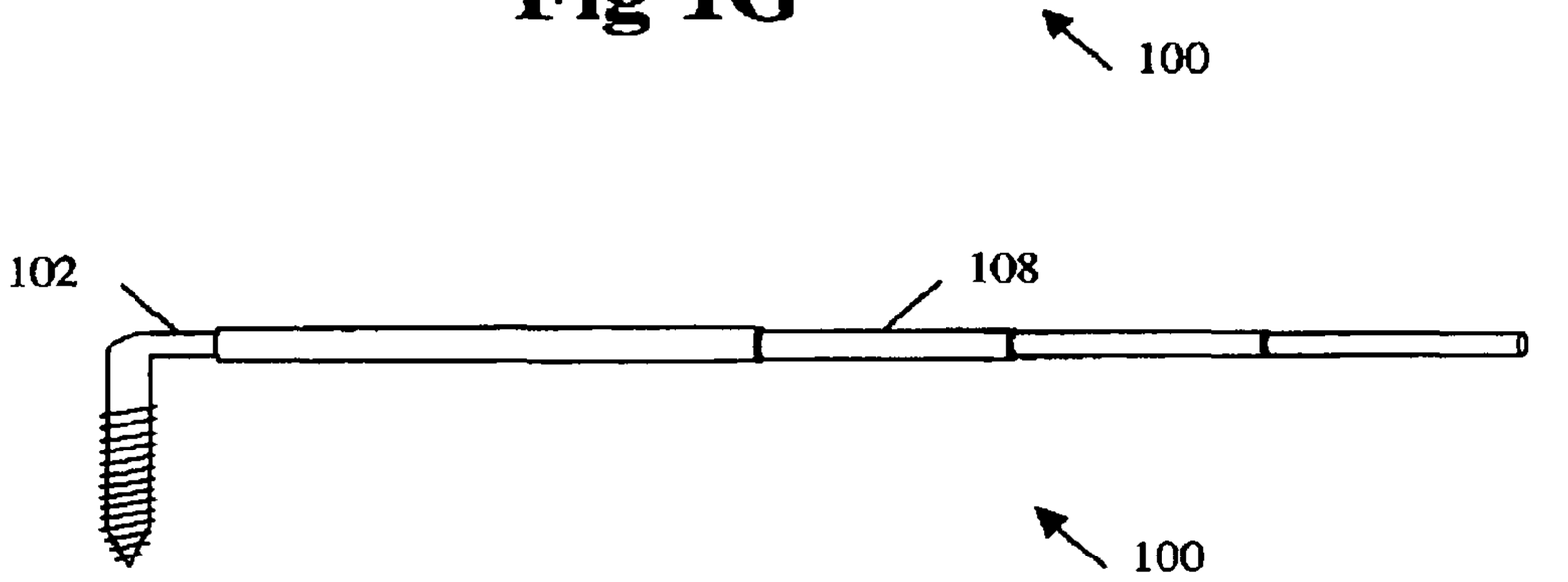

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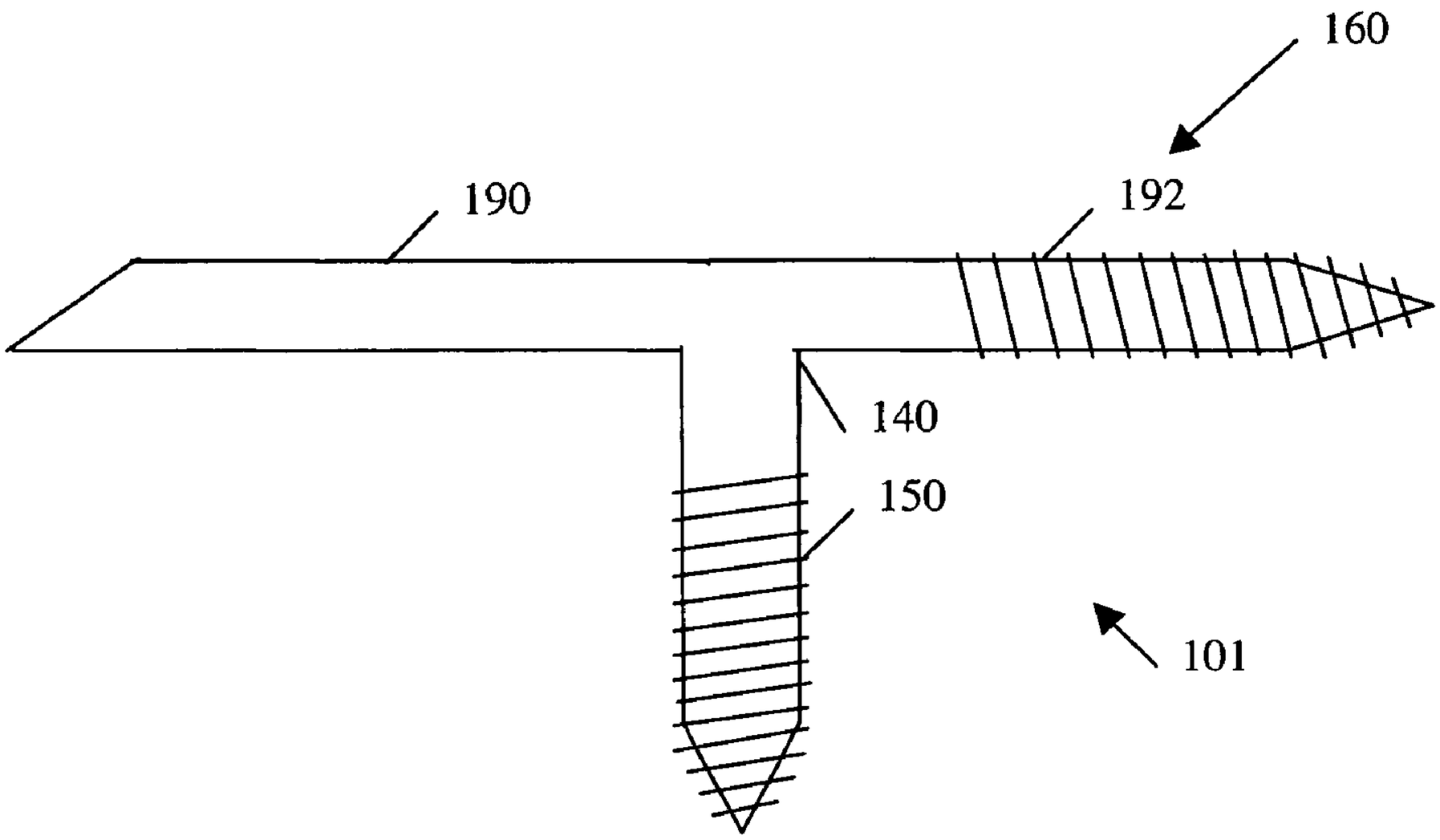

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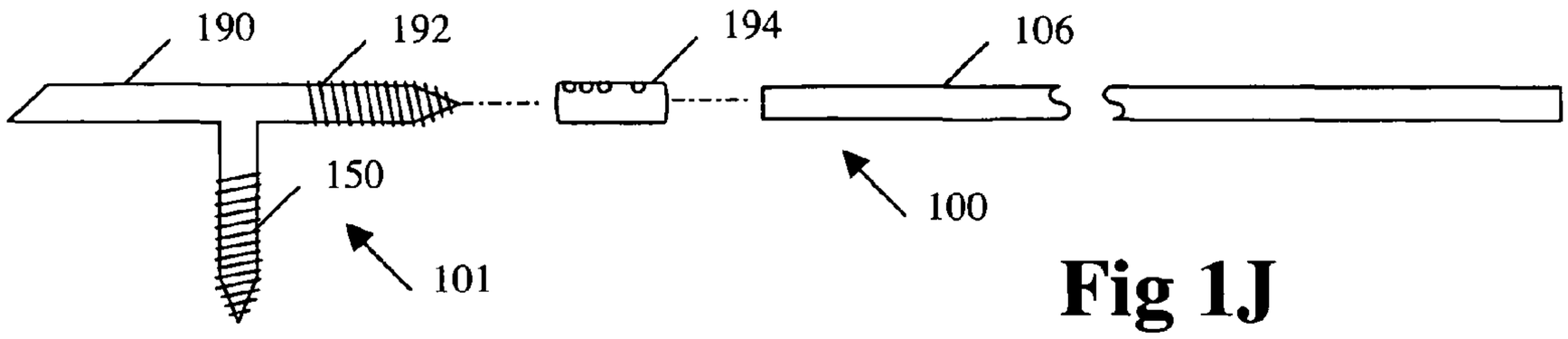

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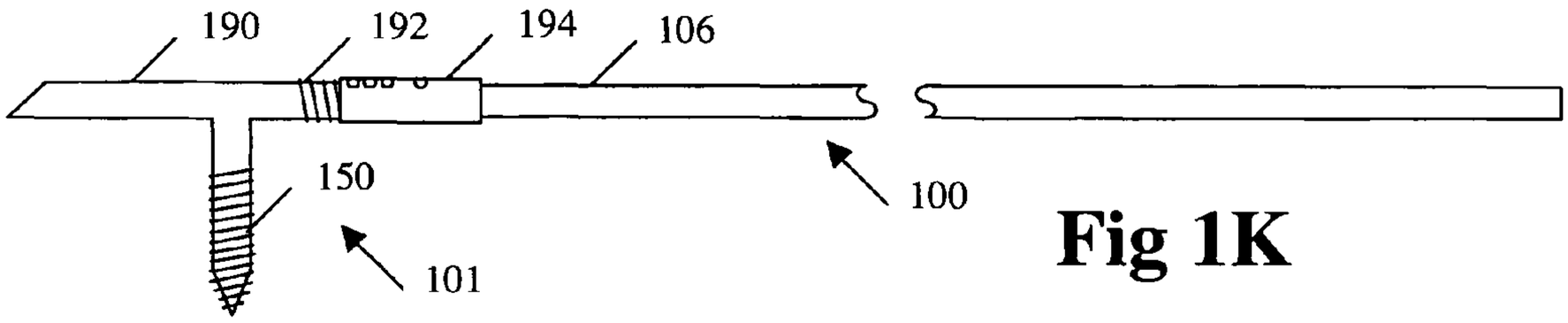

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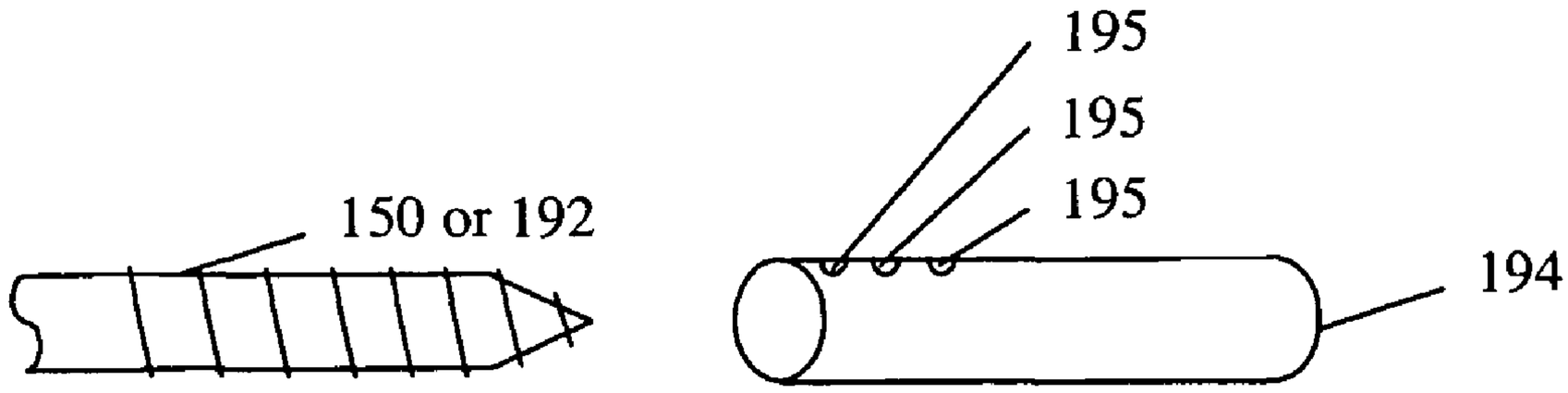

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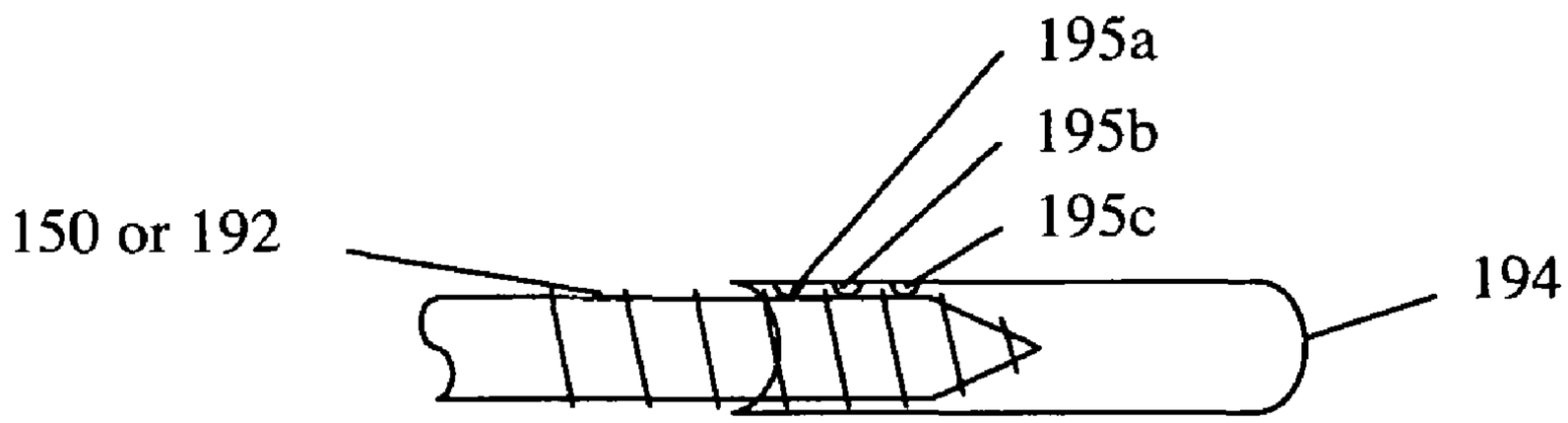

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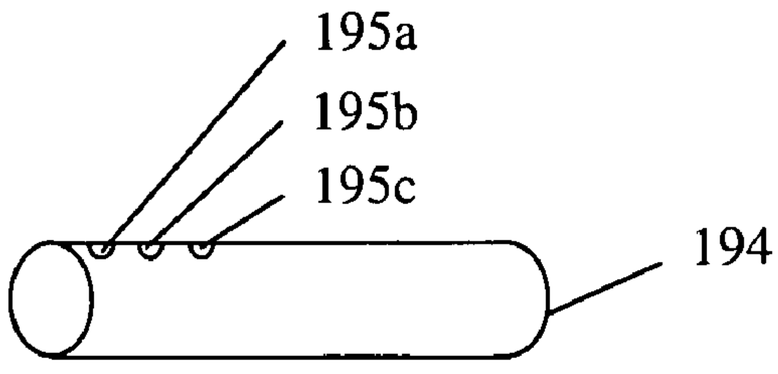

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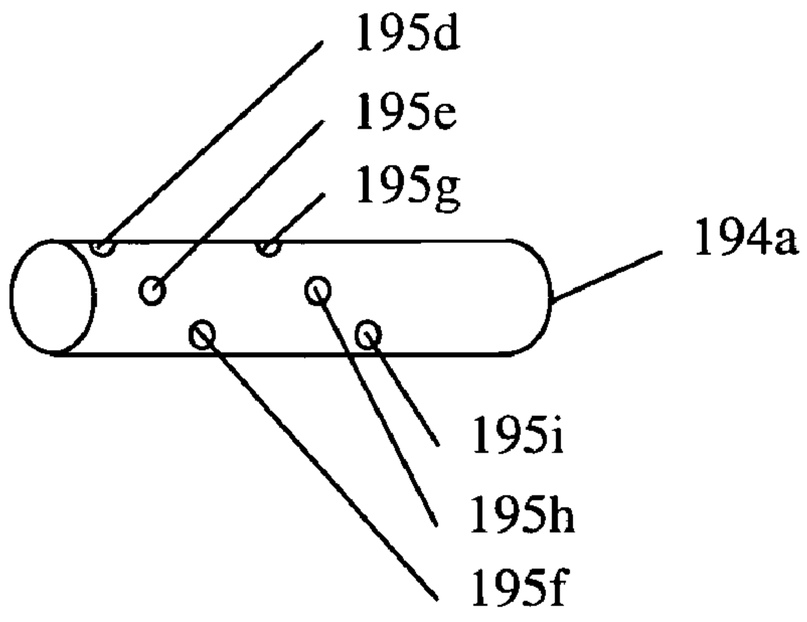

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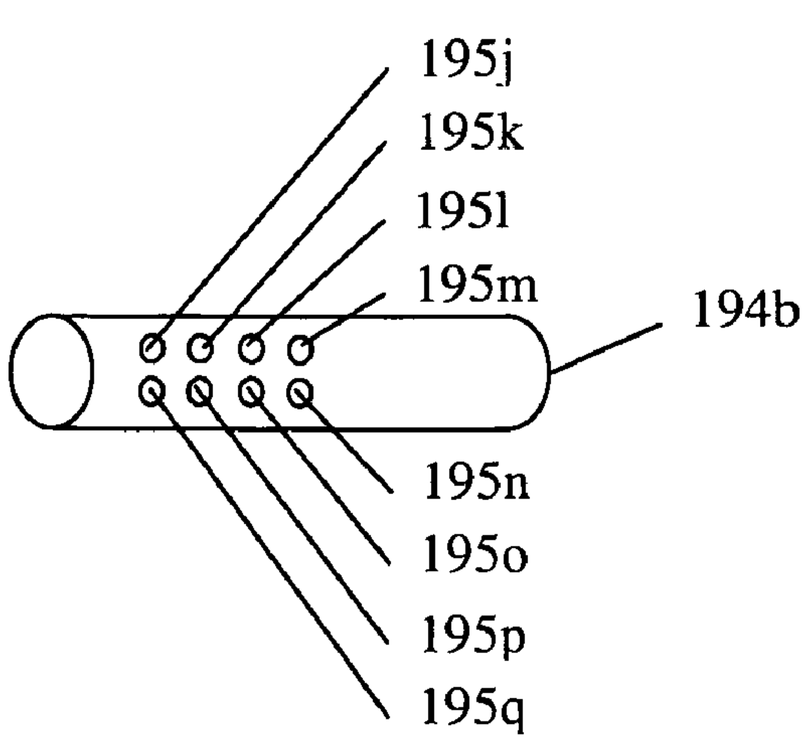

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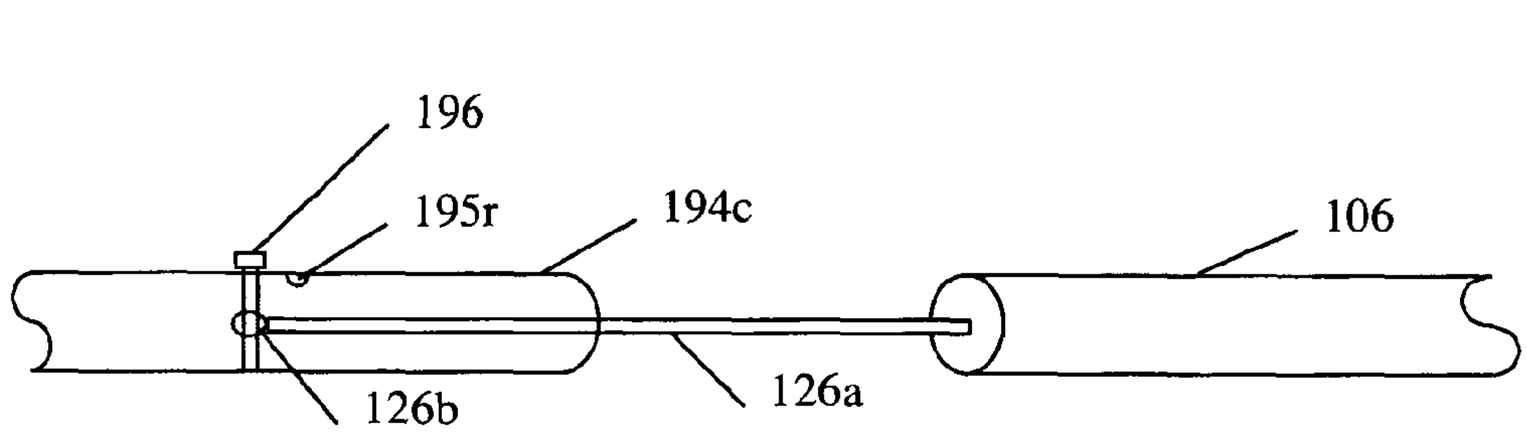
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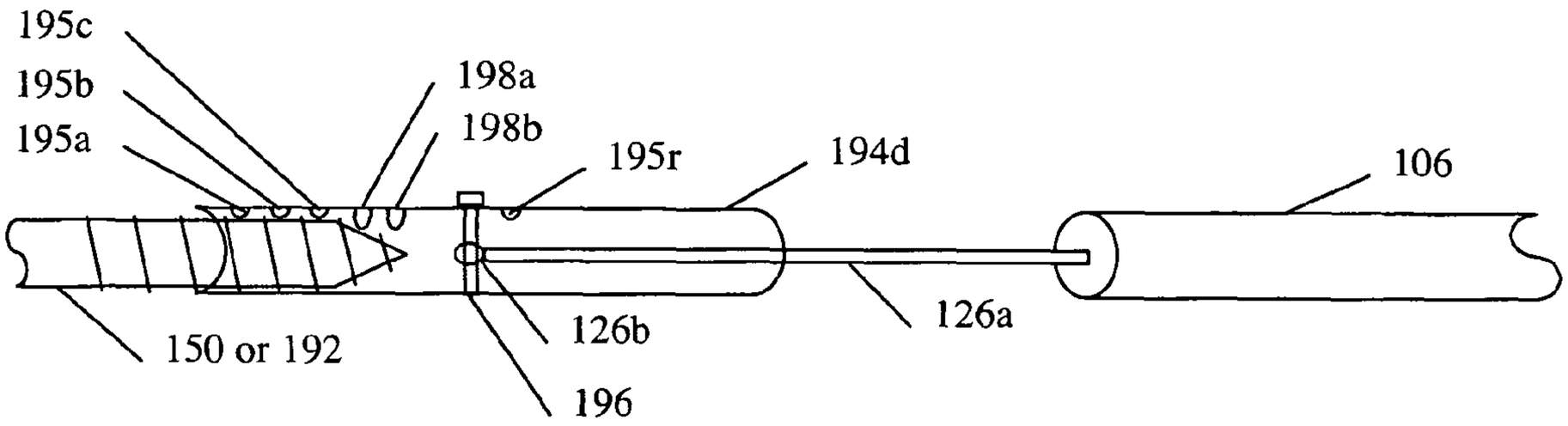
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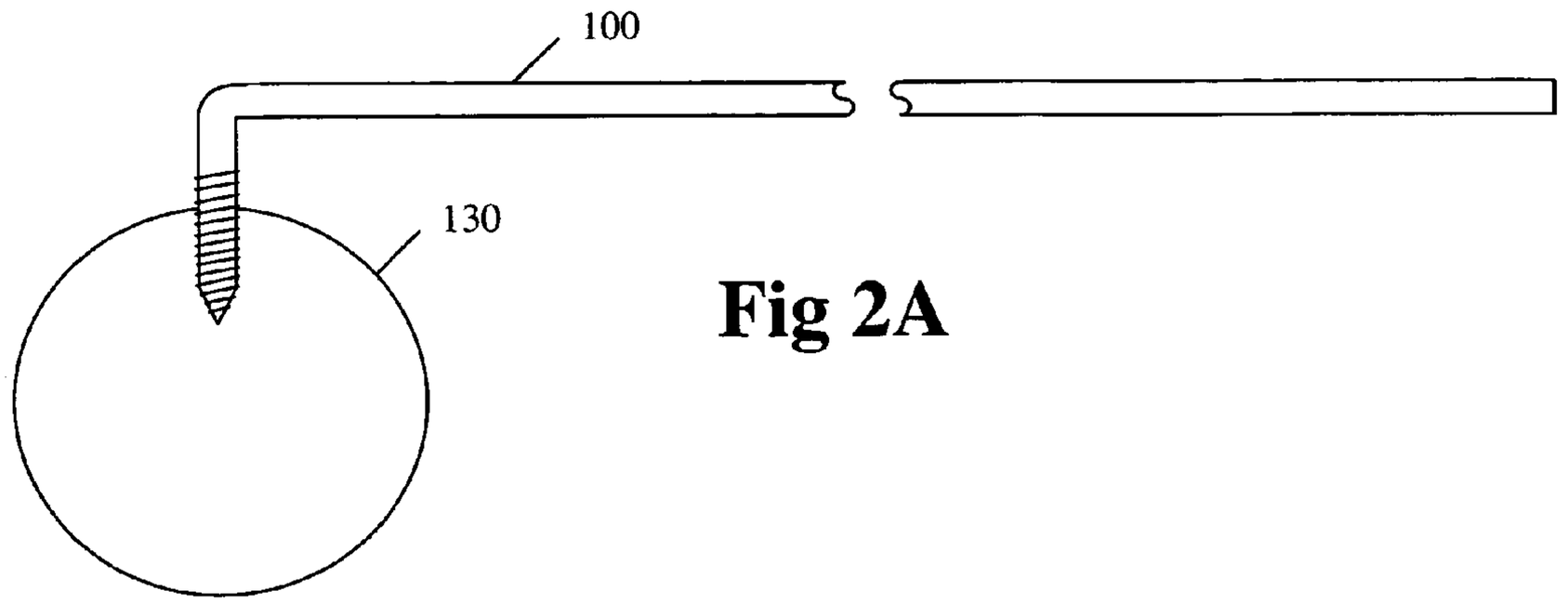

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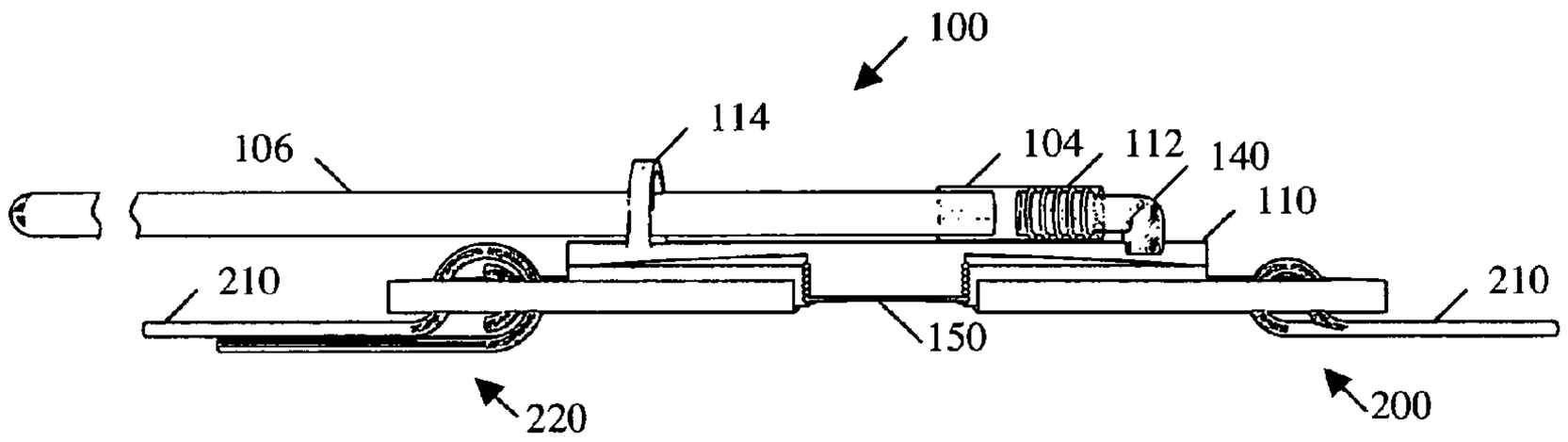

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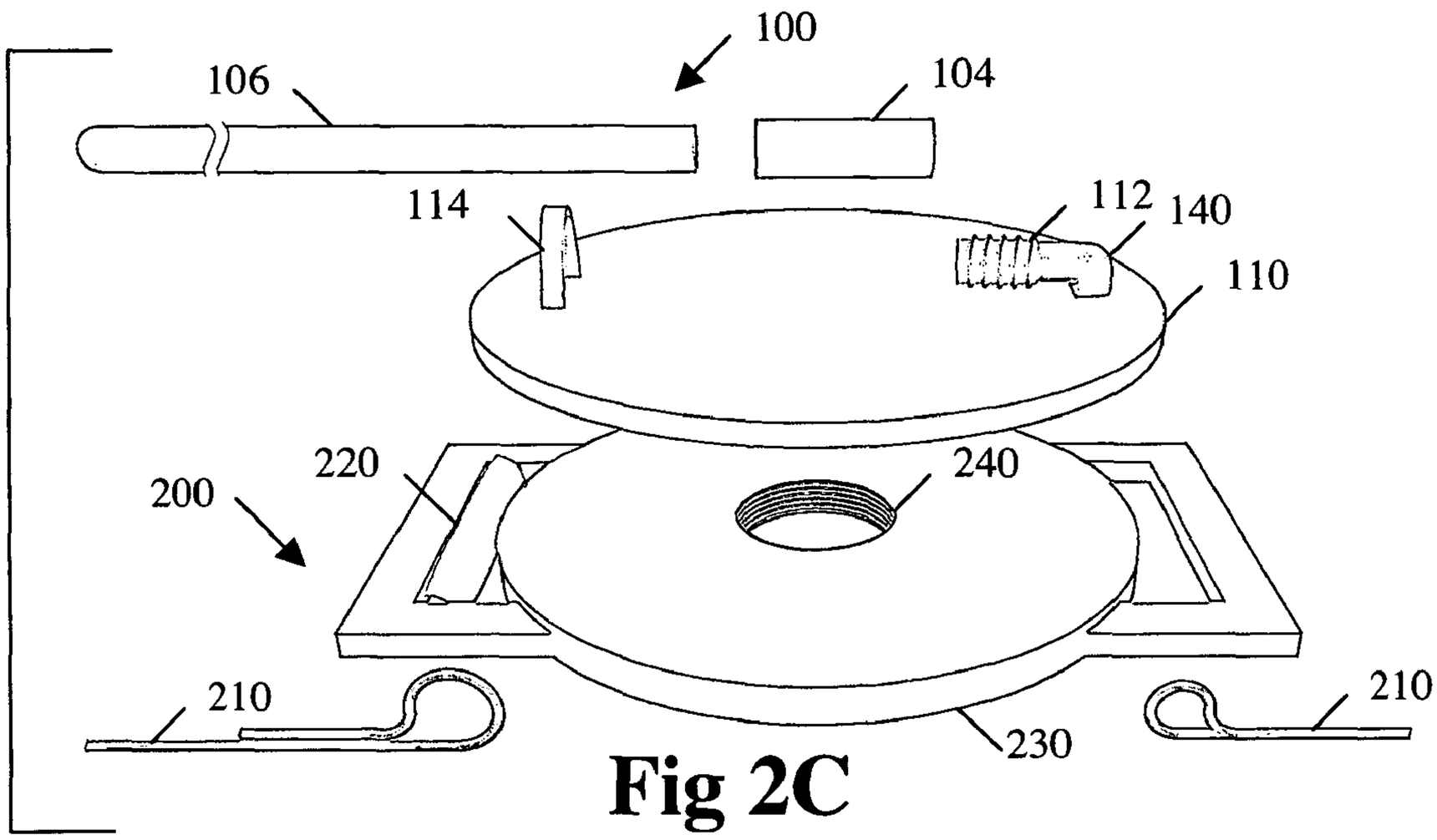
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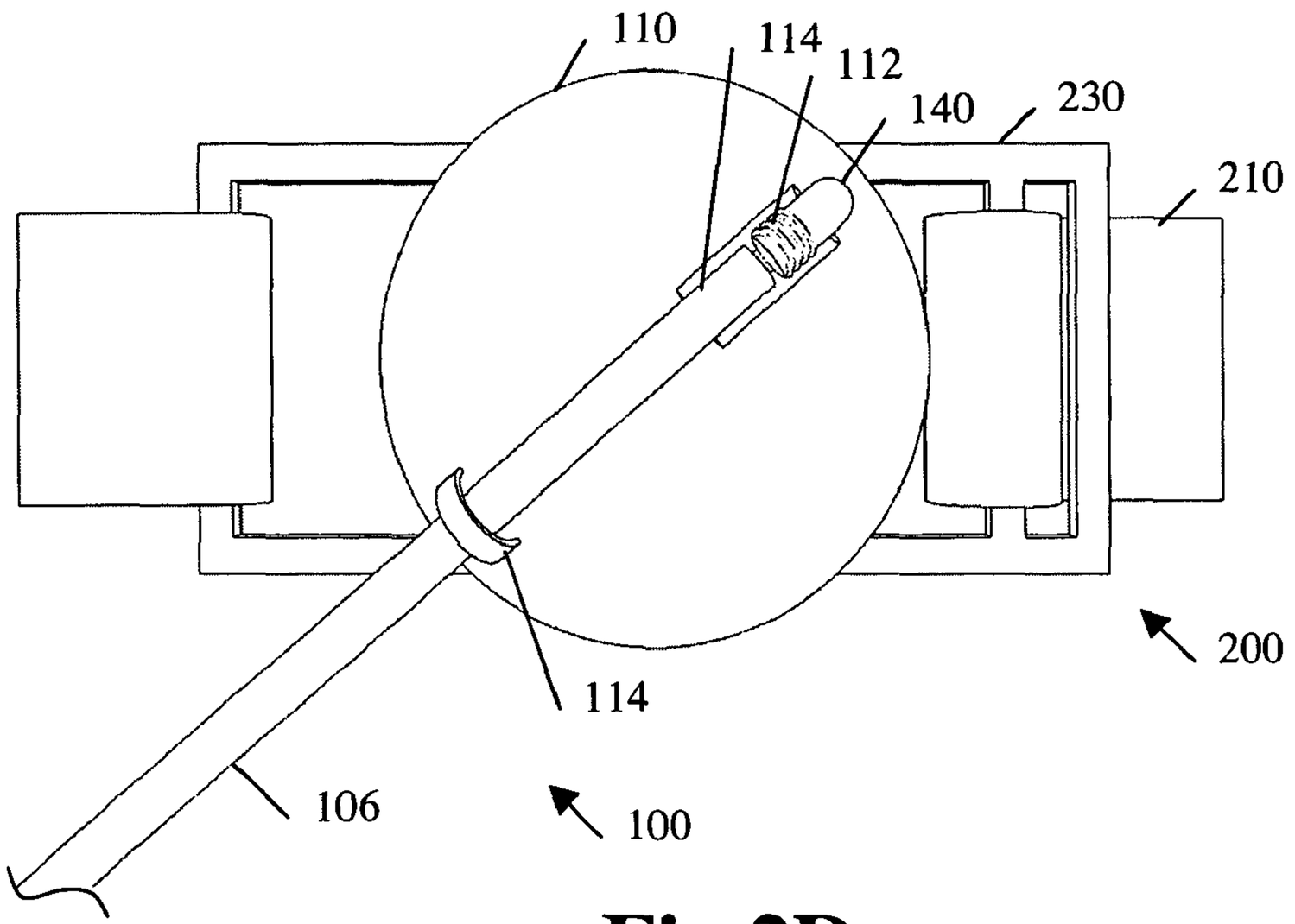
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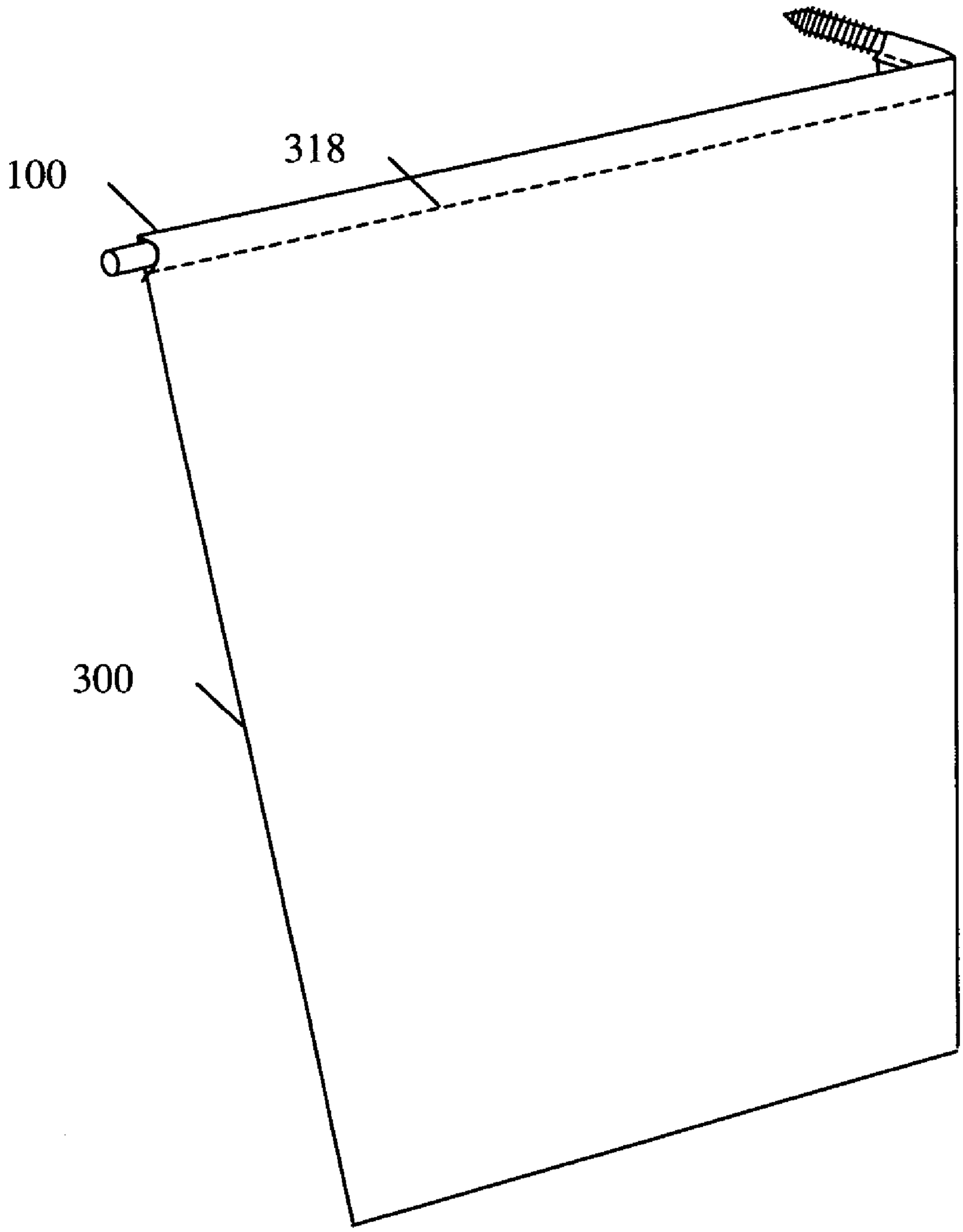

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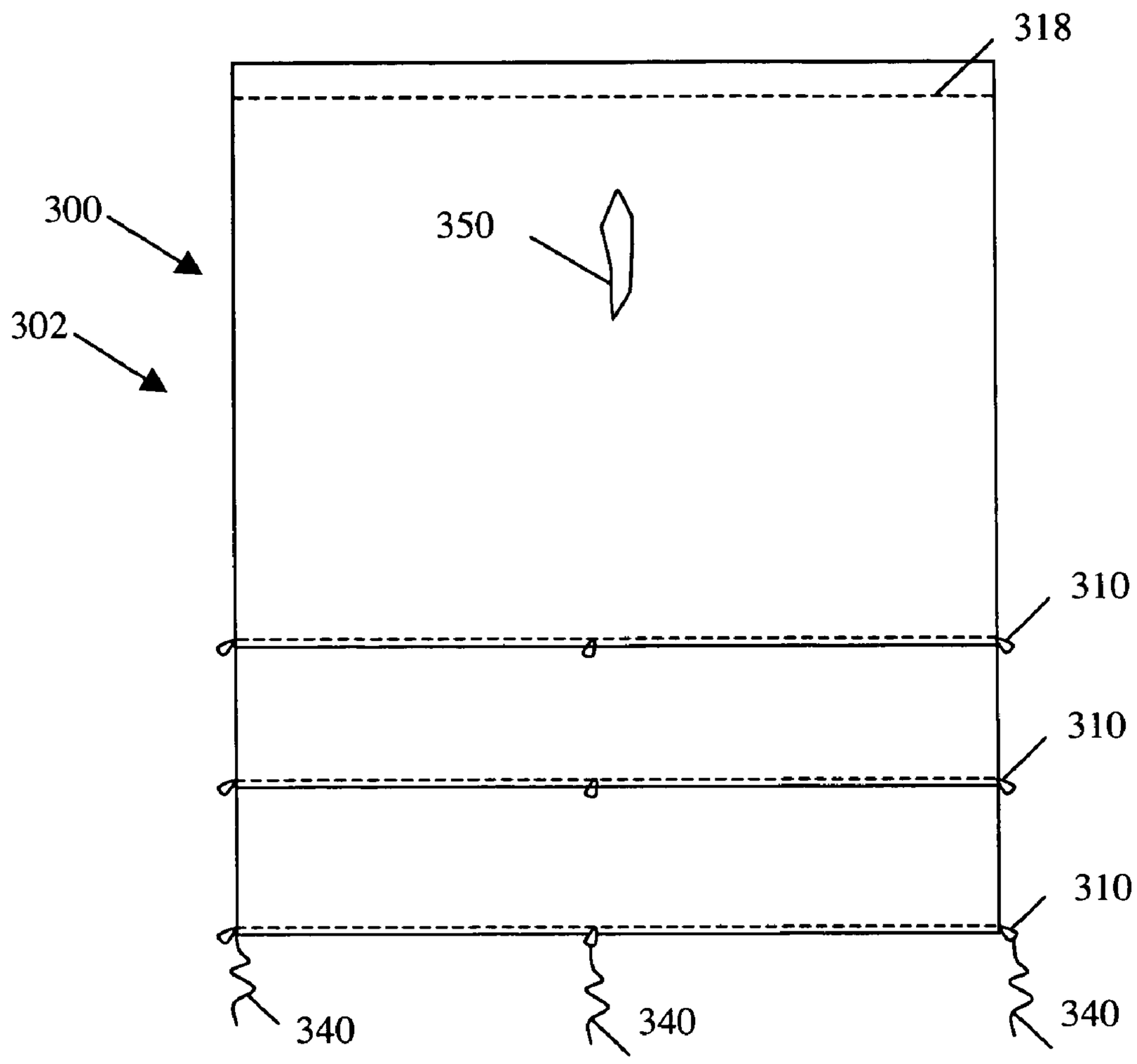

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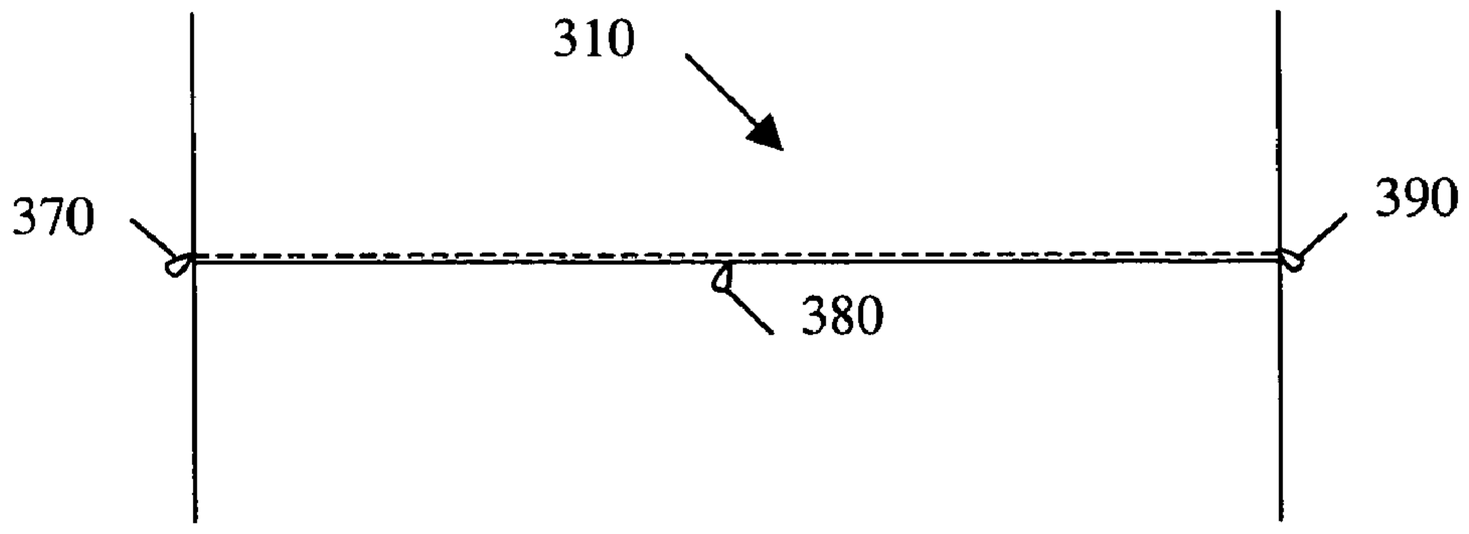

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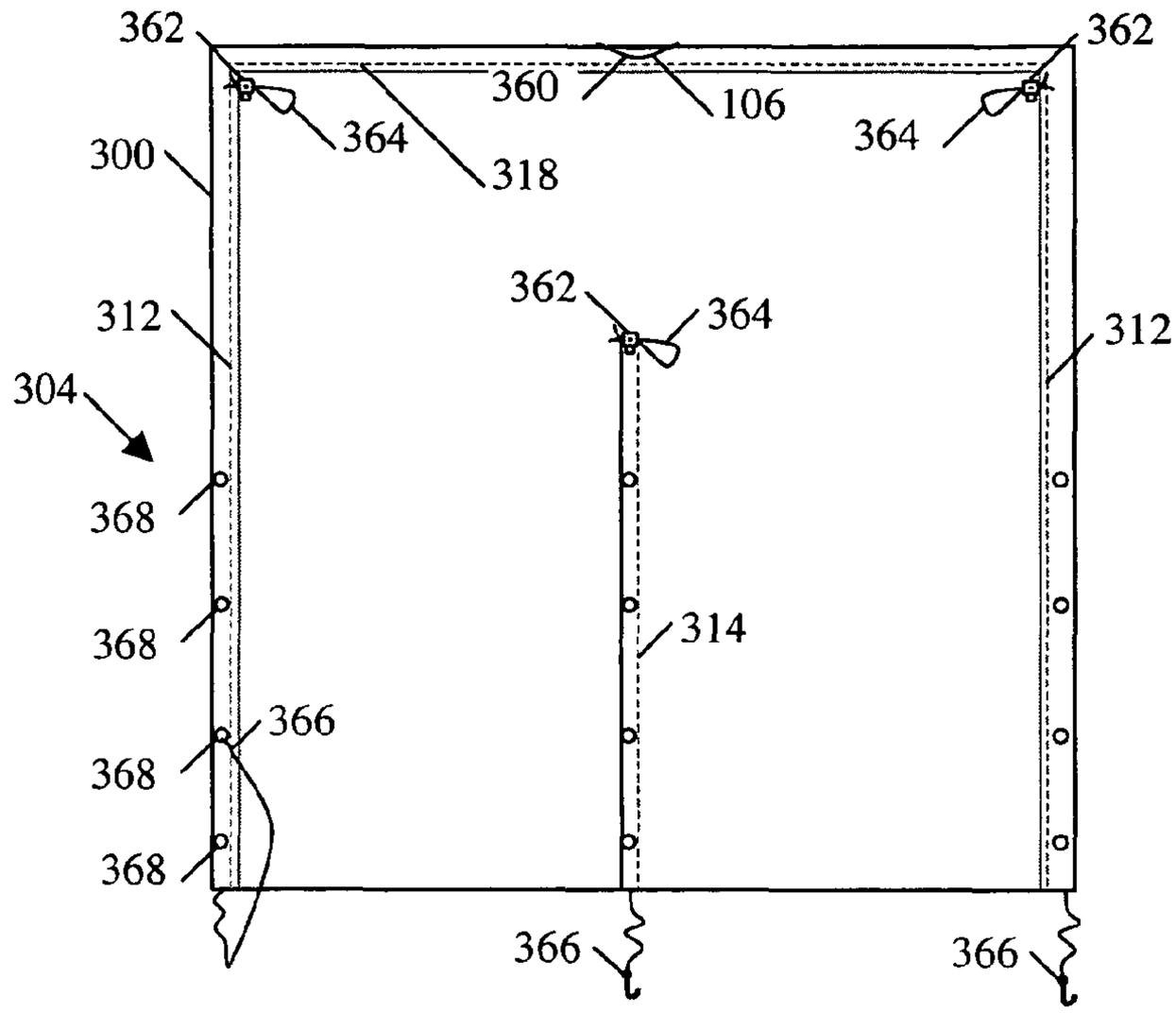

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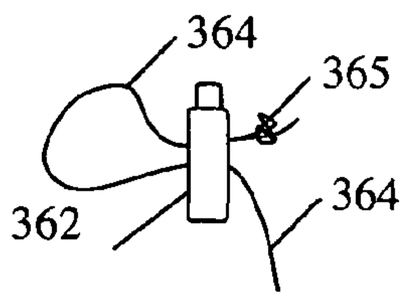

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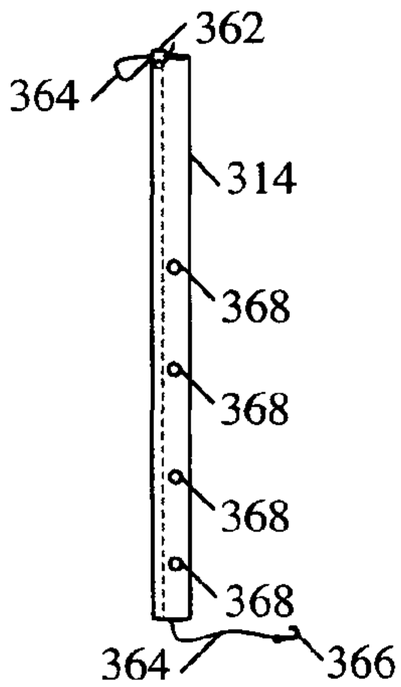

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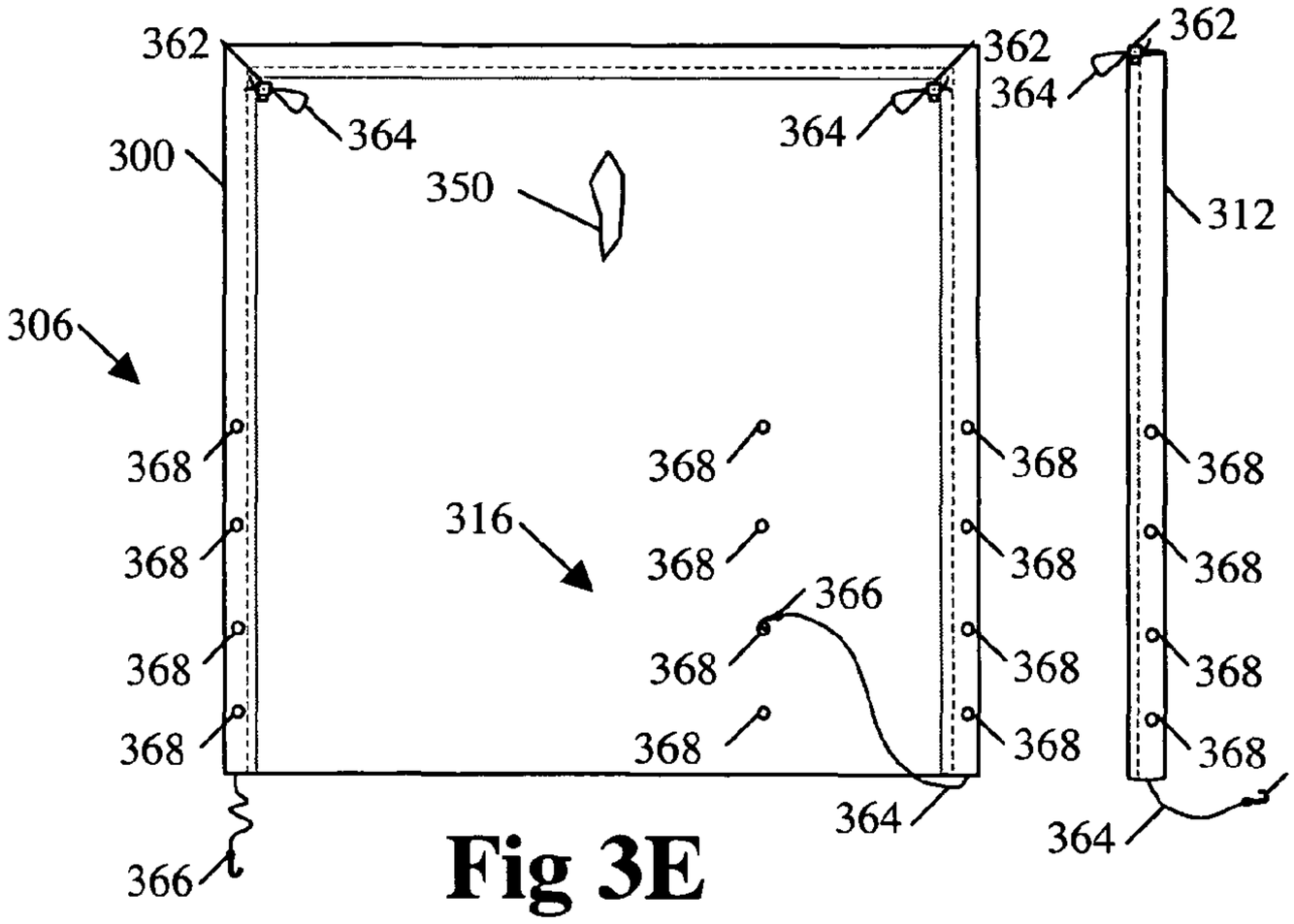

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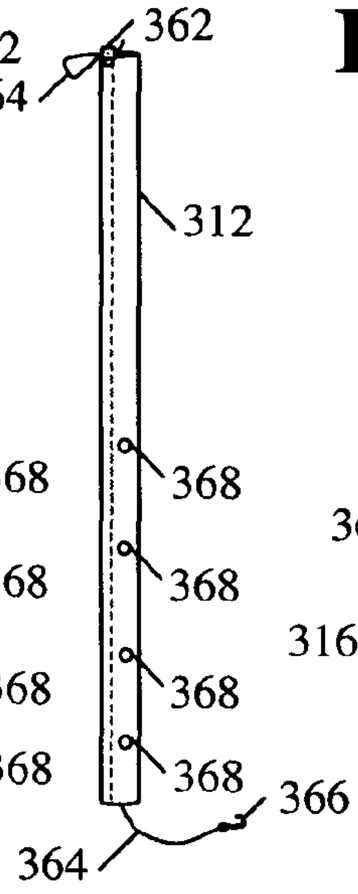


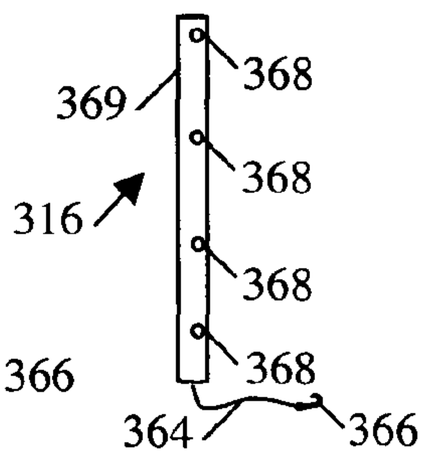


Fig 3F Fig 3I

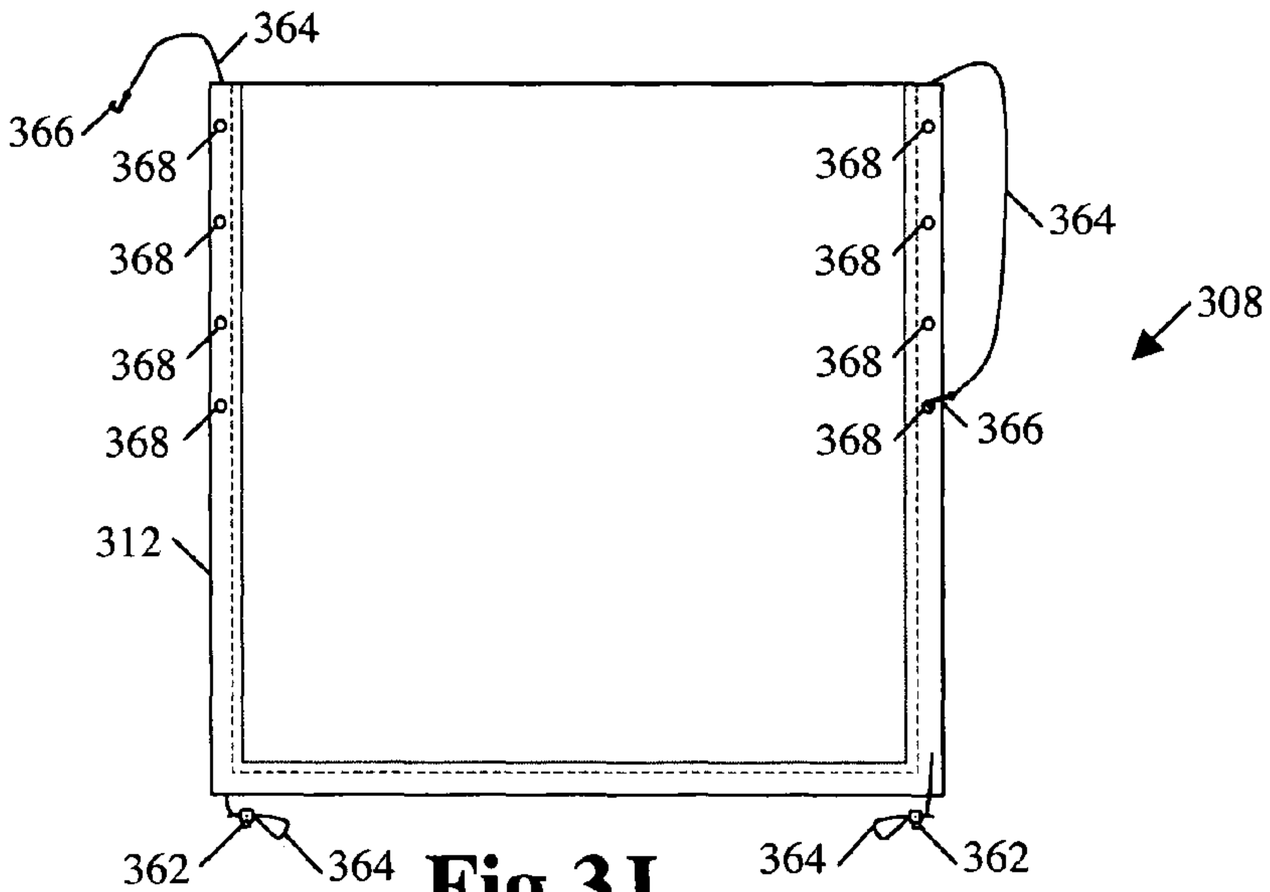


Fig 3J

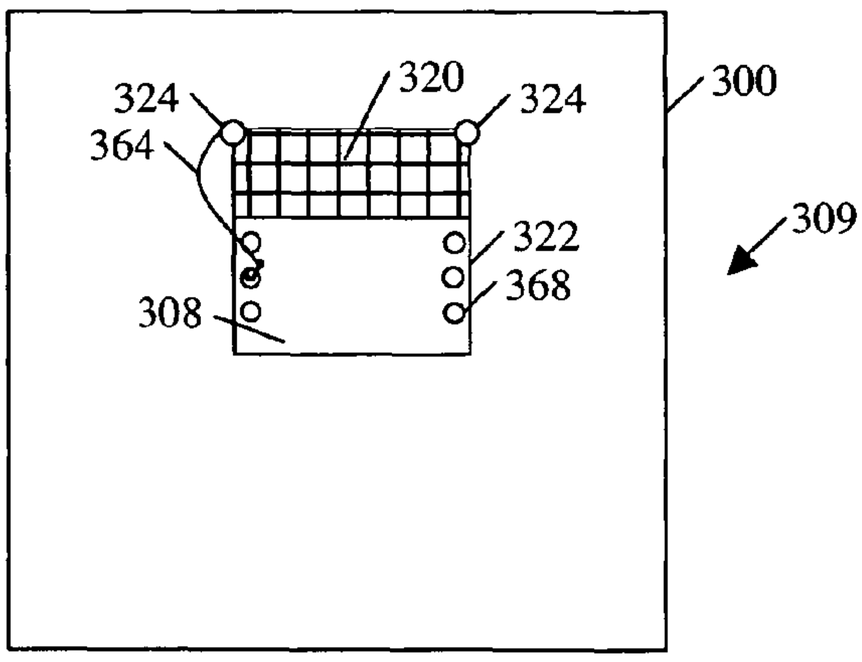


Fig 3K

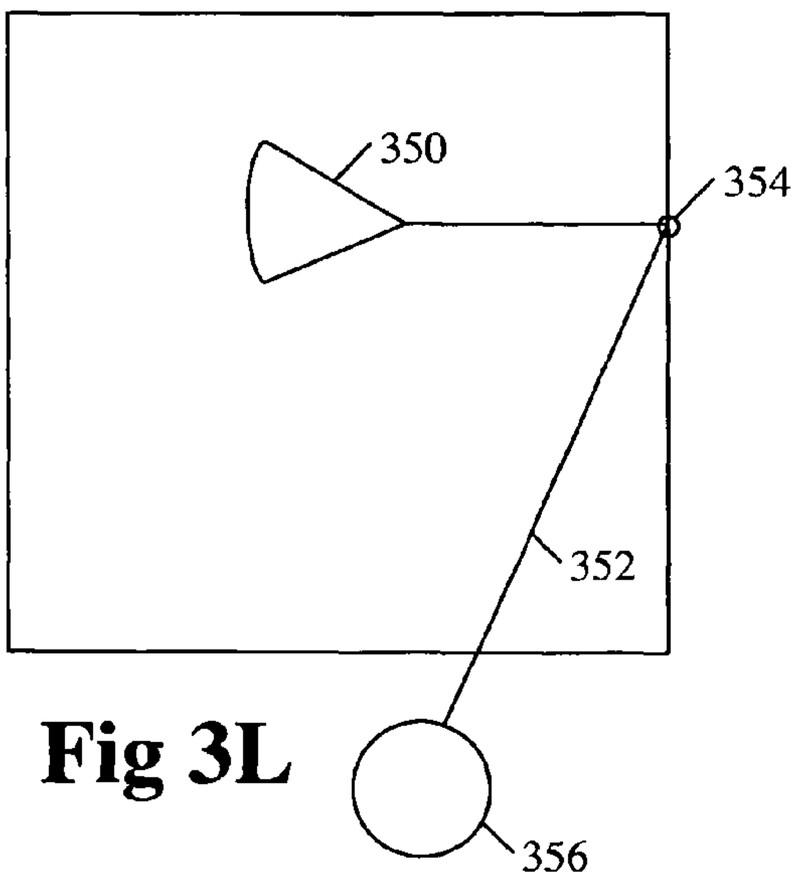
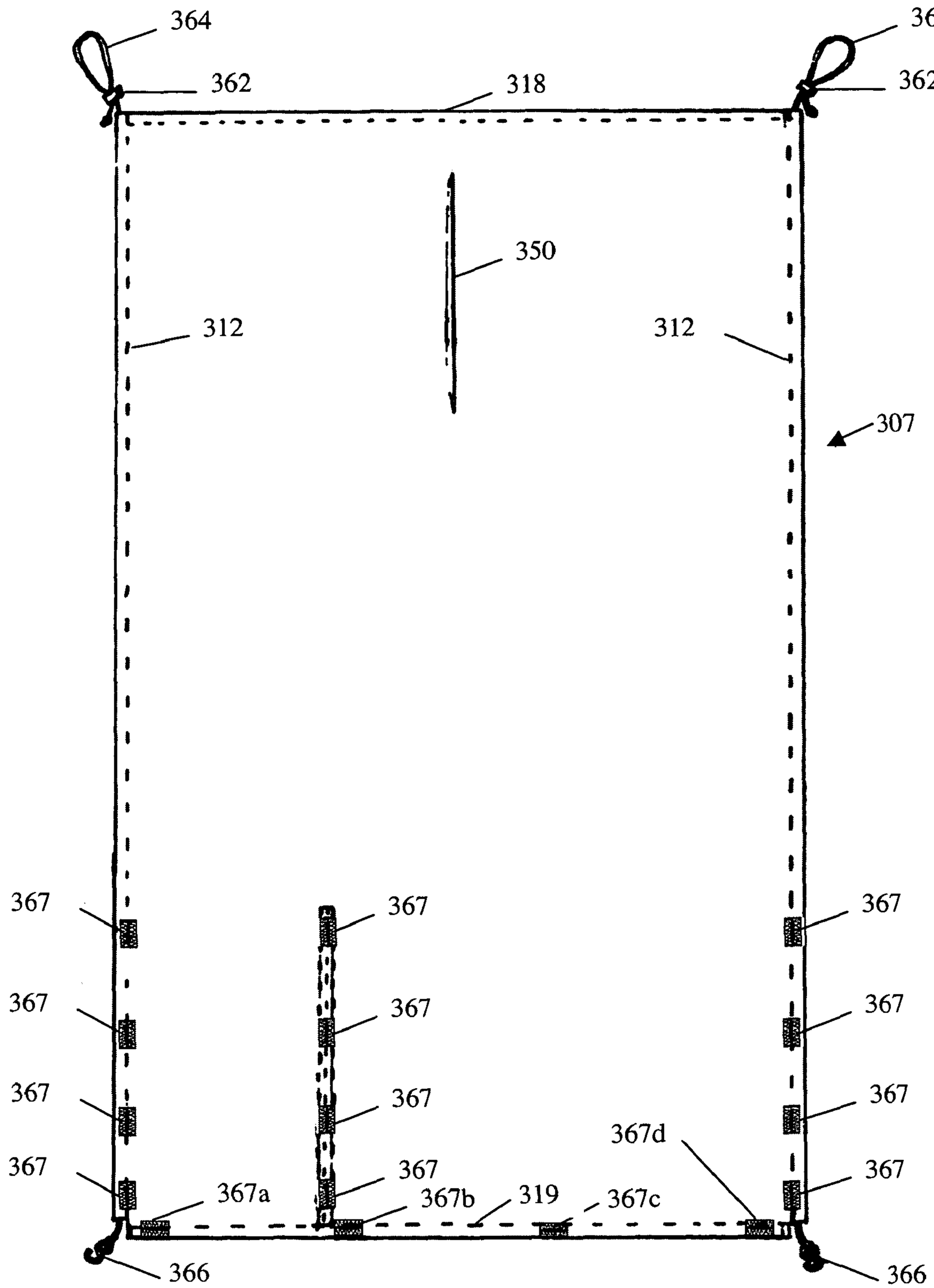


Fig 3L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367b
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367c
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Fig 3M

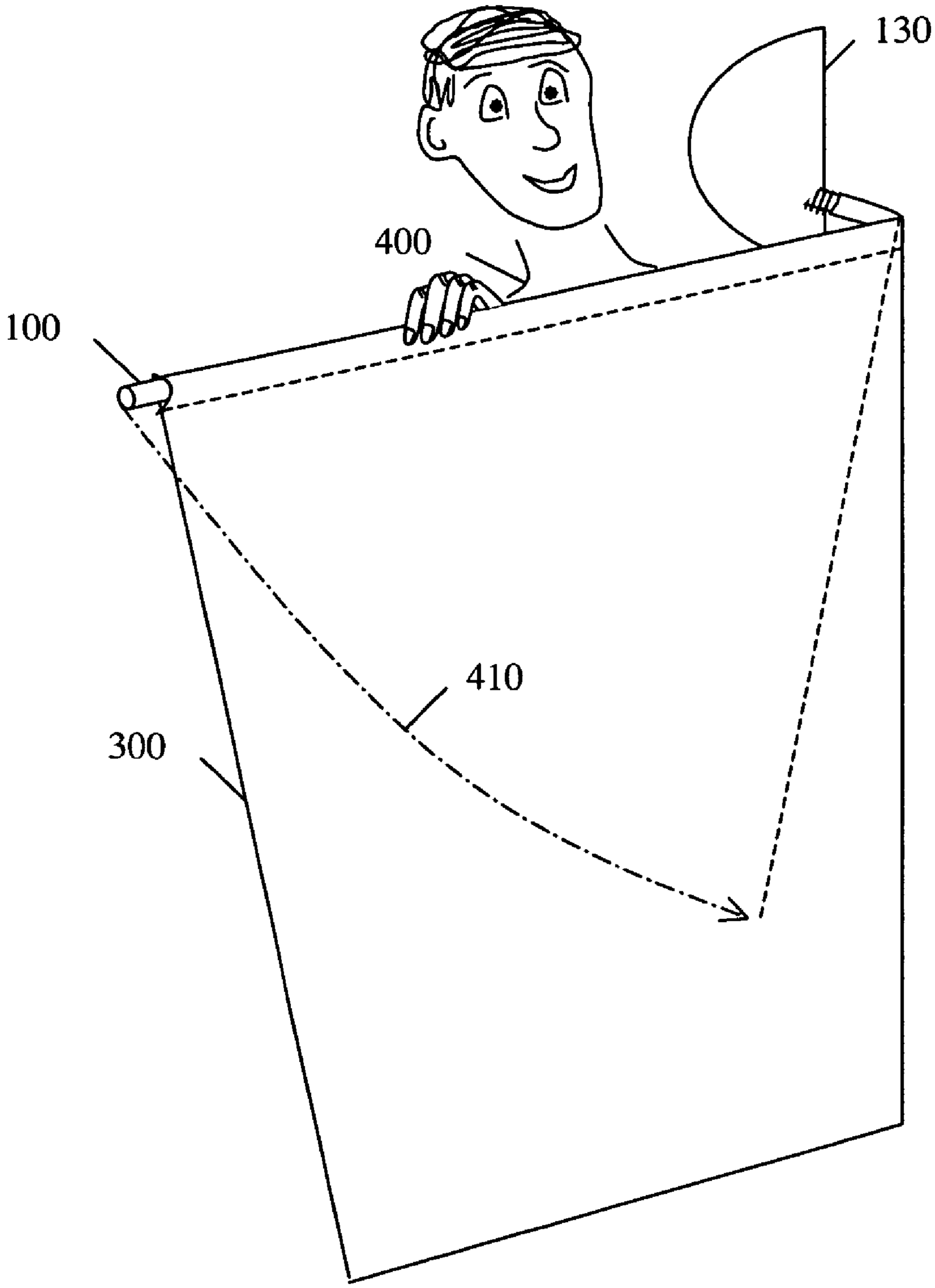


Fig 4A

Fig 4B

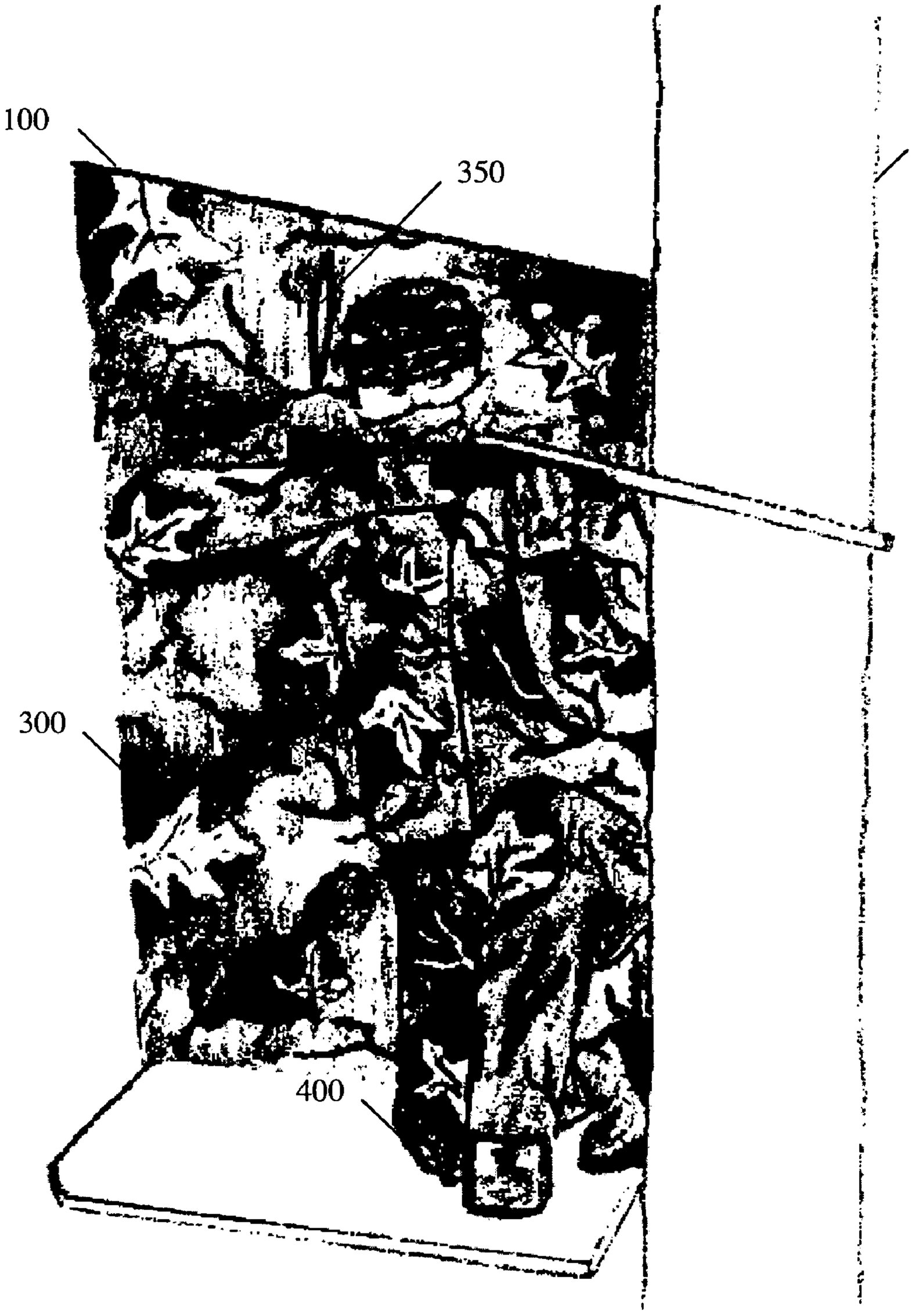


Fig 4C

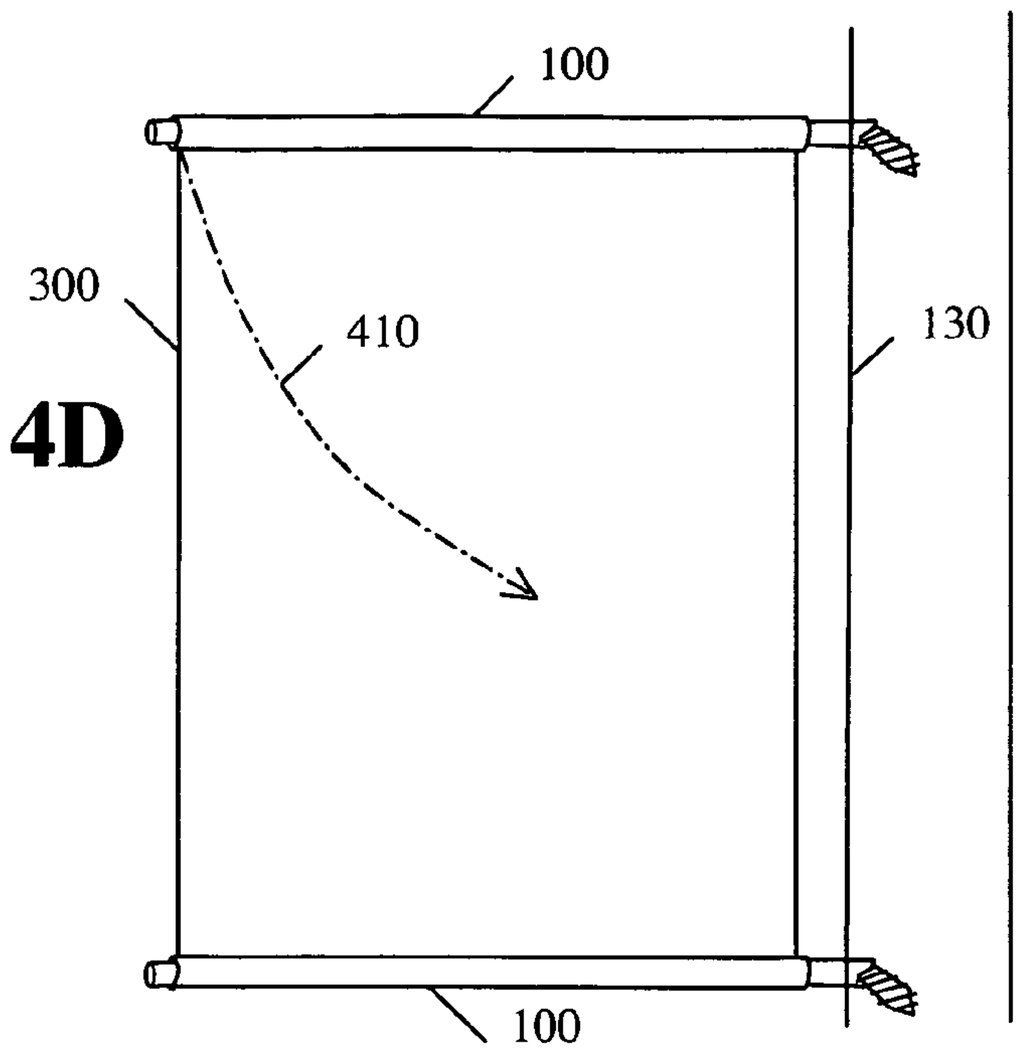


Fig 4D

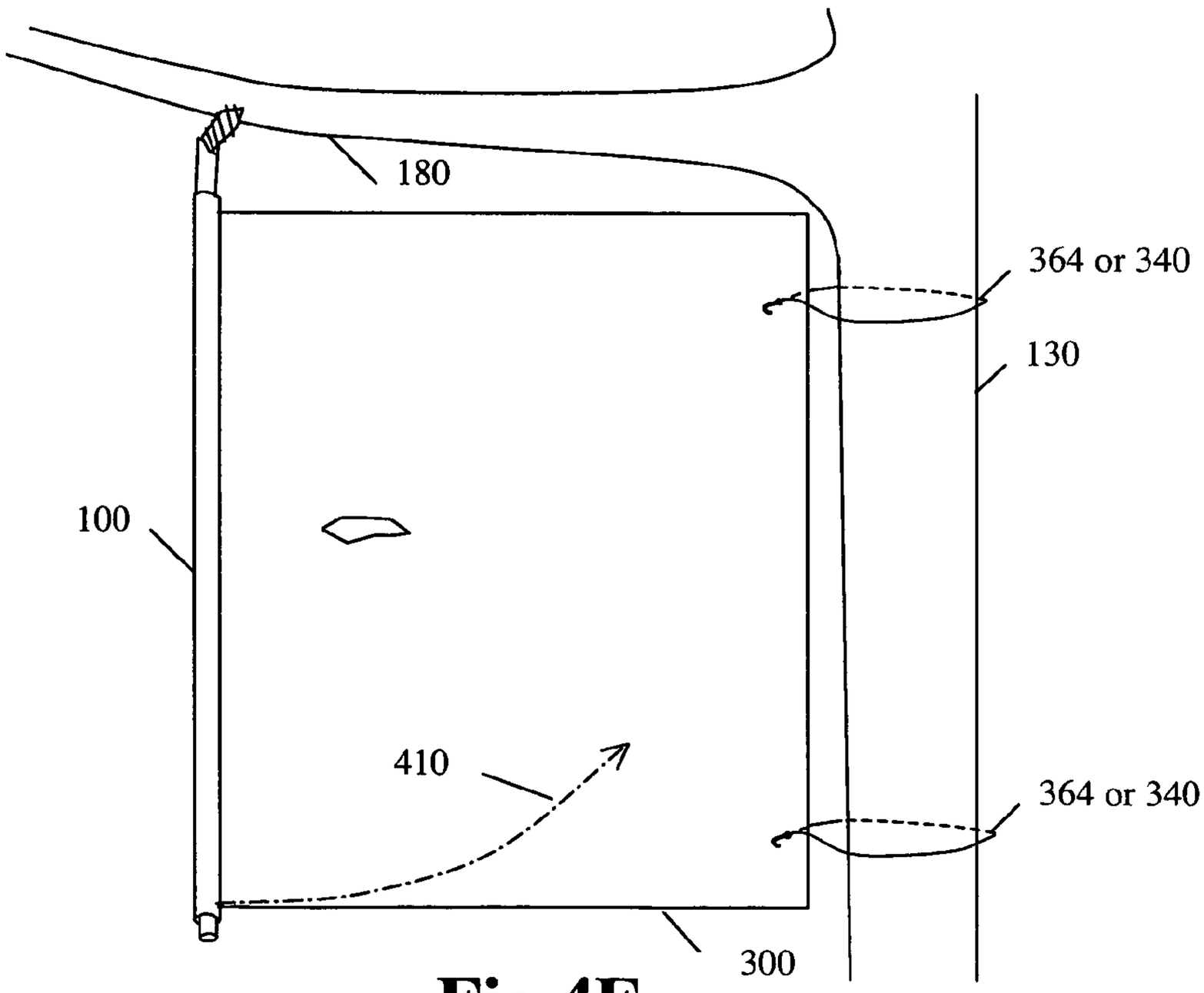


Fig 4E

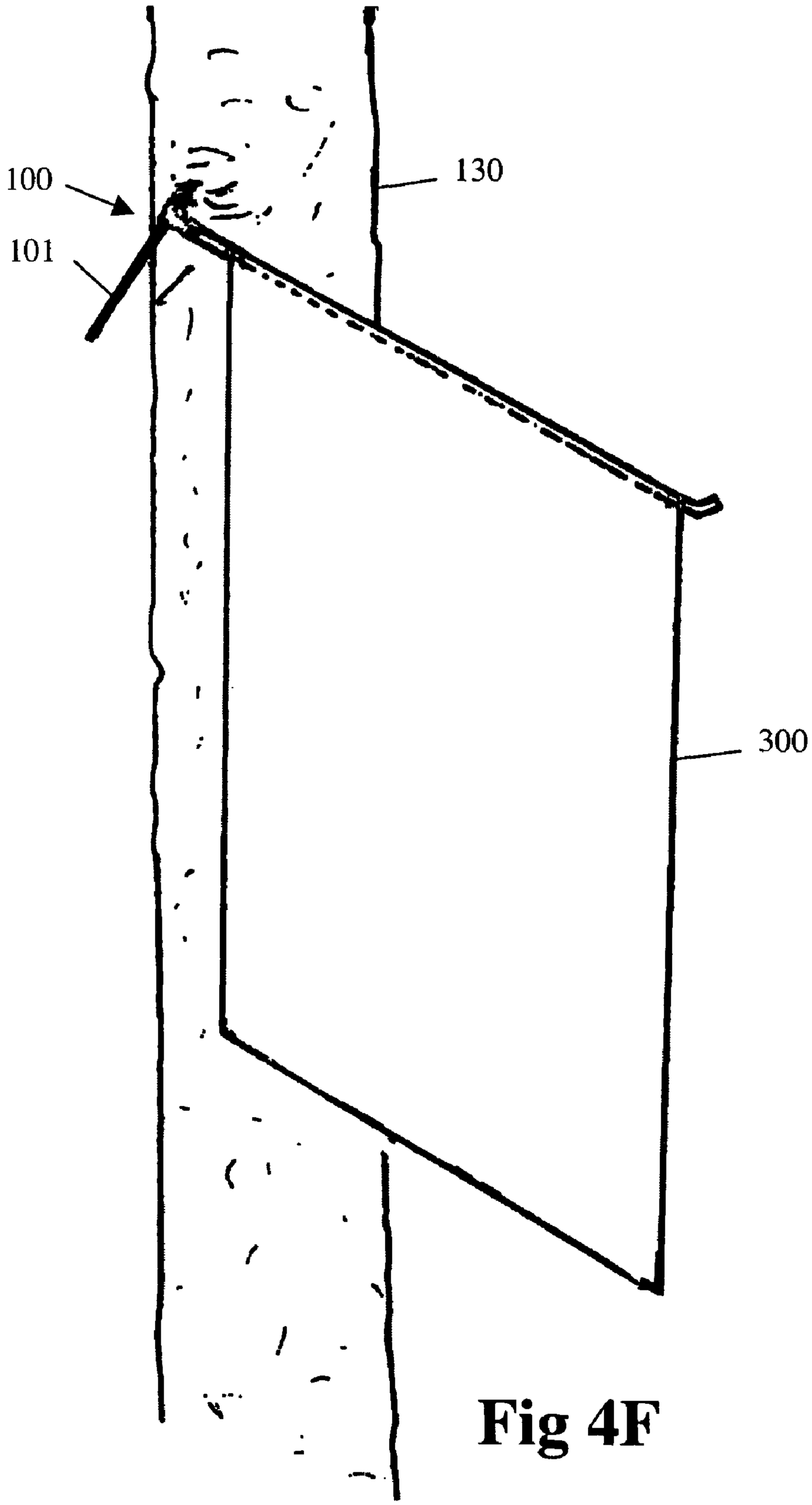


Fig 4F

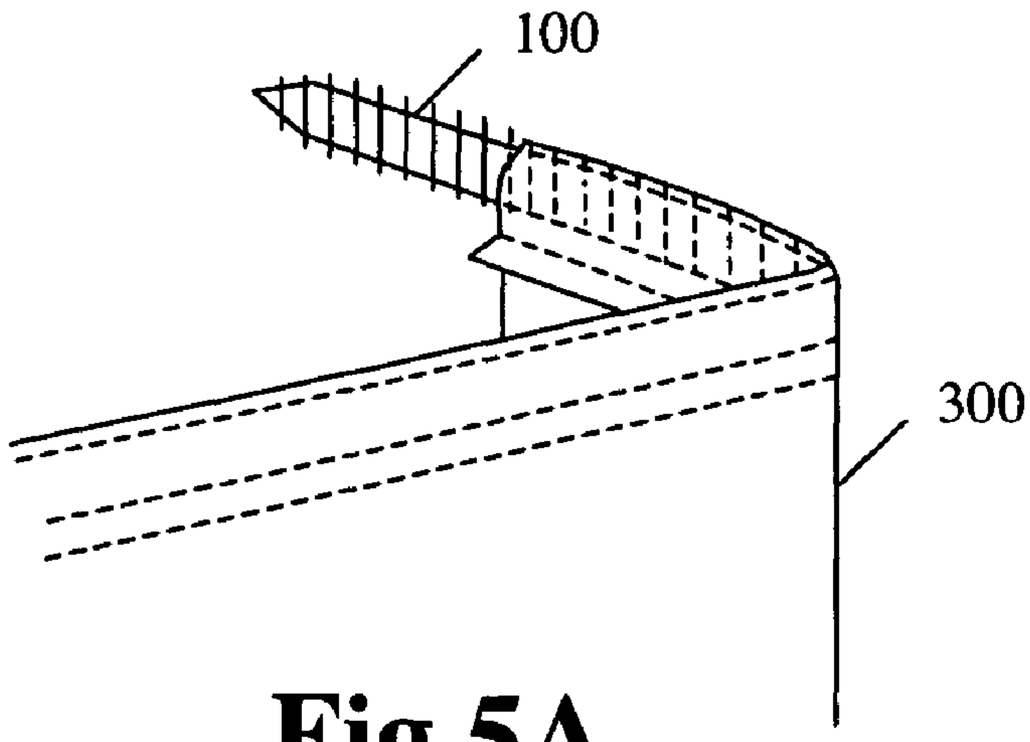


Fig 5A

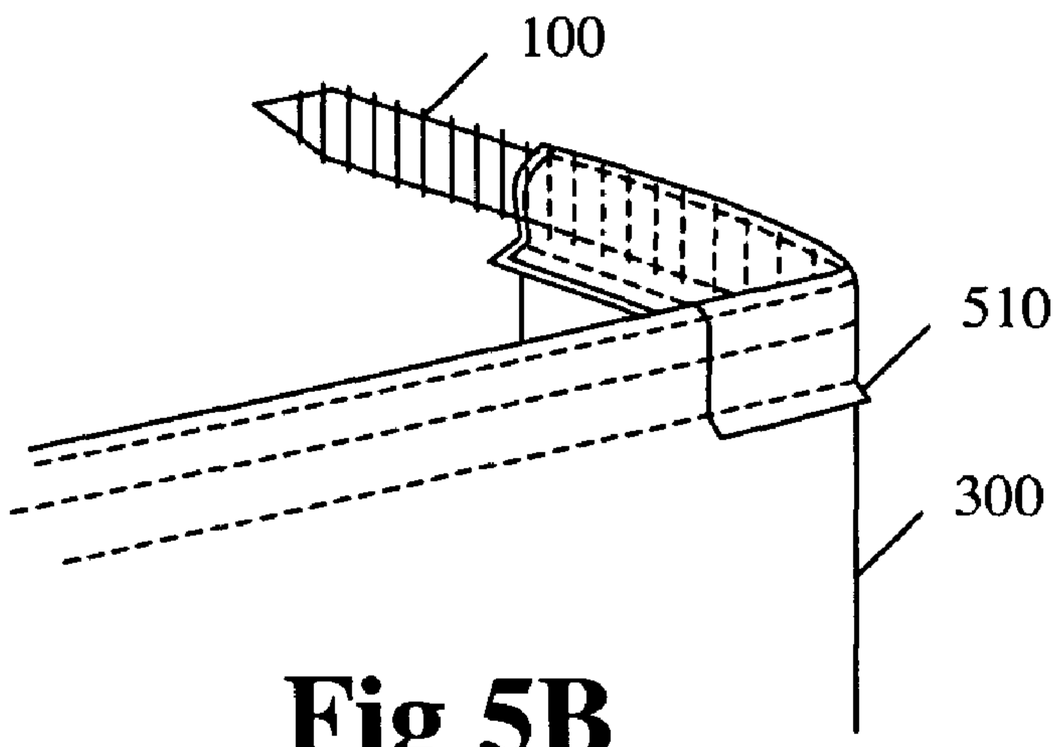


Fig 5B

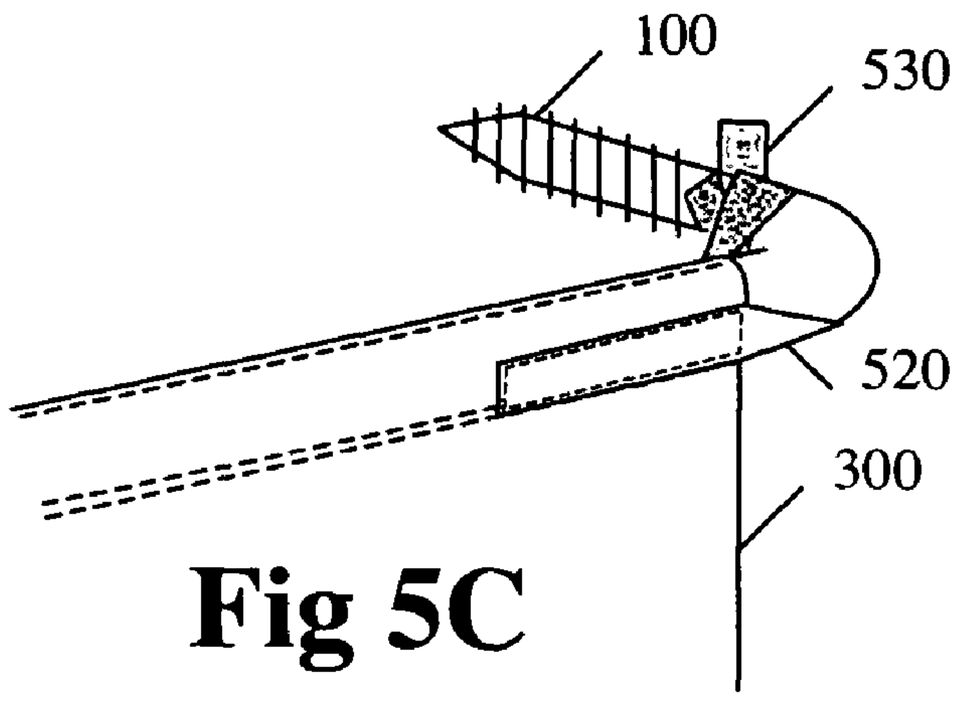


Fig 5C

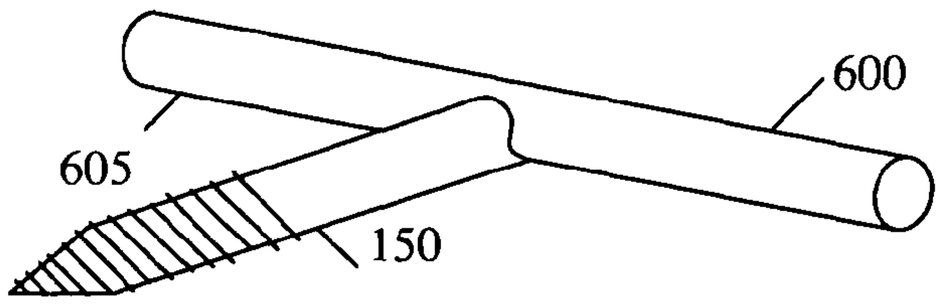


Fig 6A

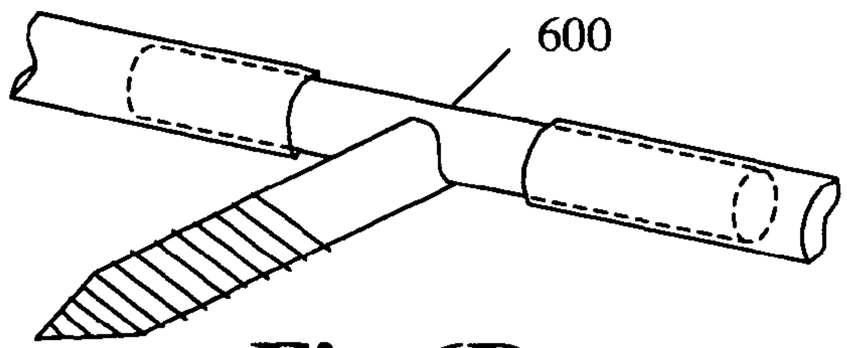


Fig 6B

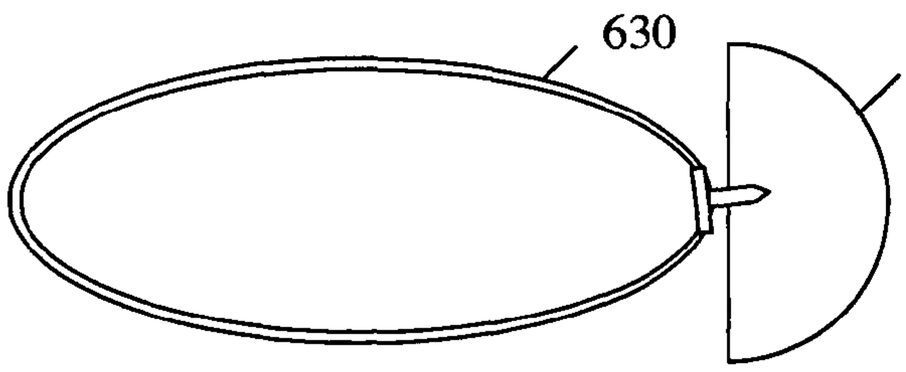


Fig 6C

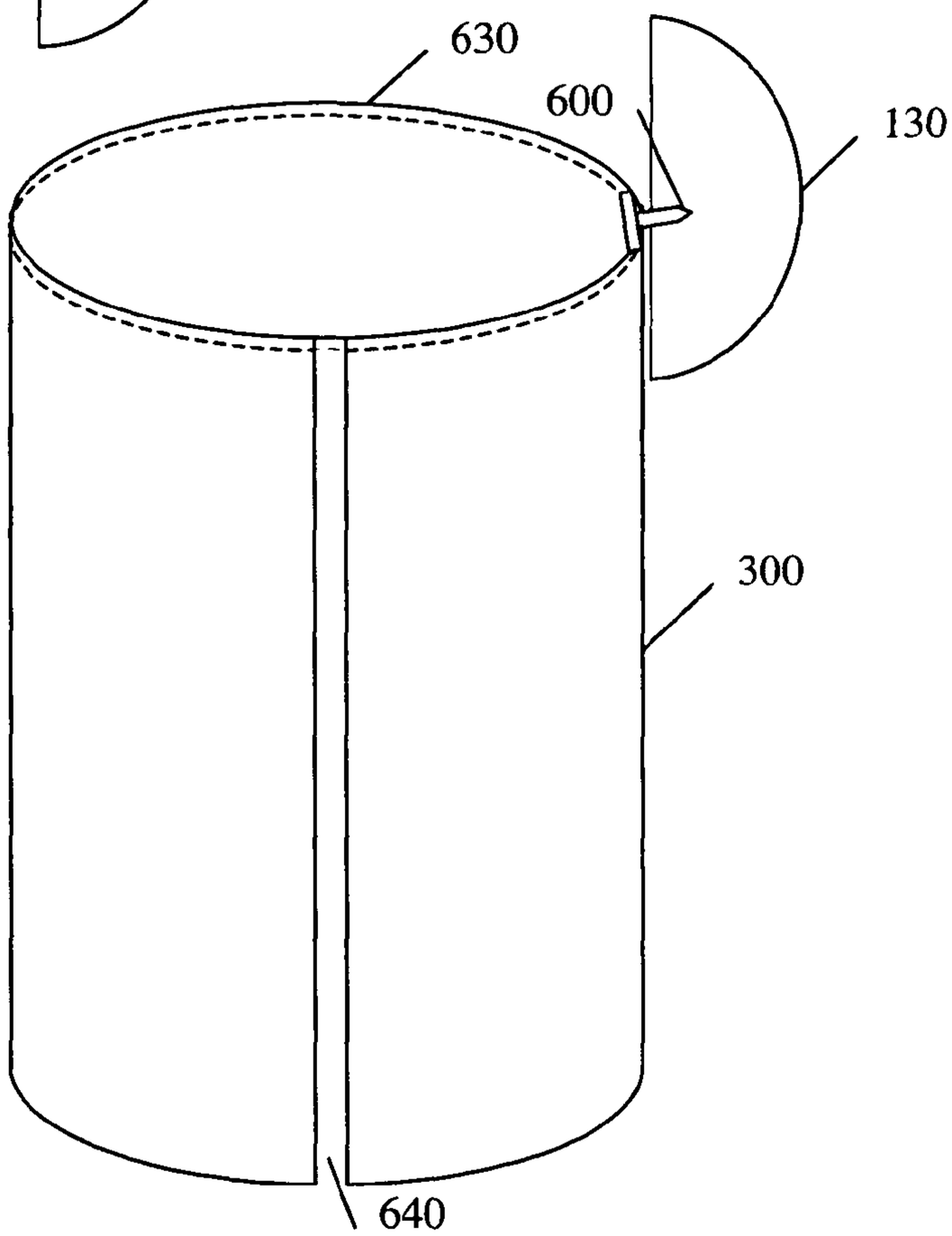


Fig 6D

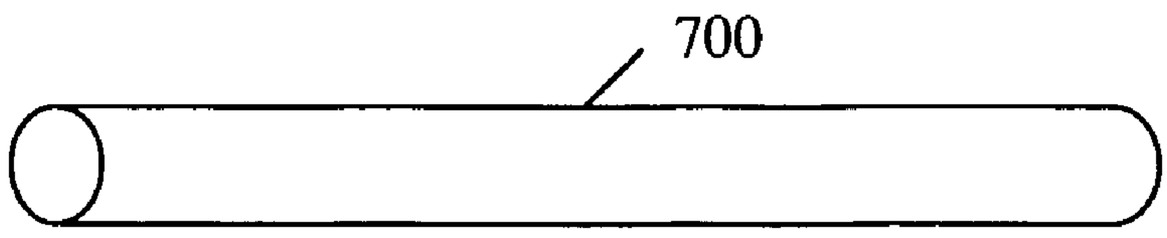


Fig 7A

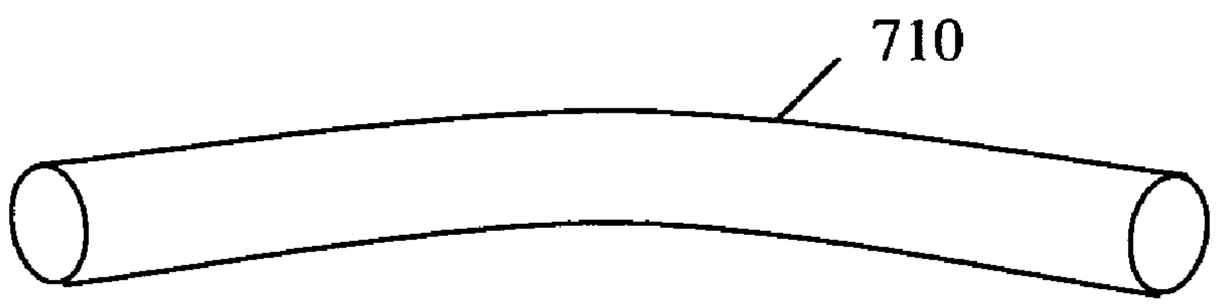


Fig 7B

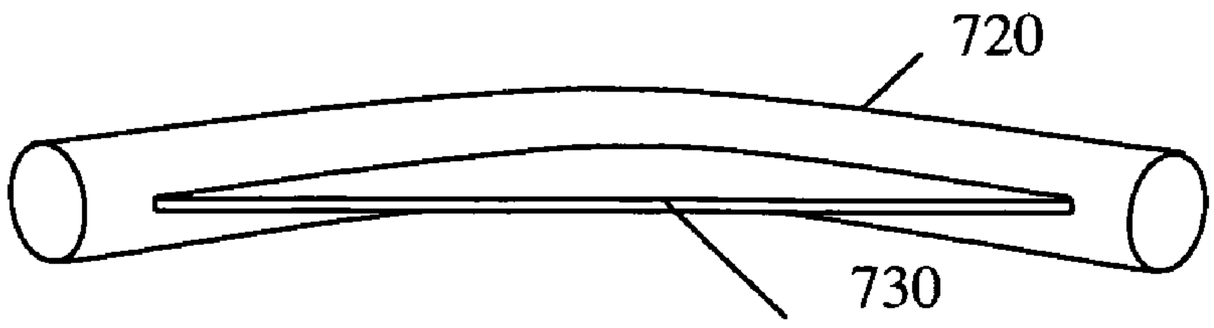


Fig 7C

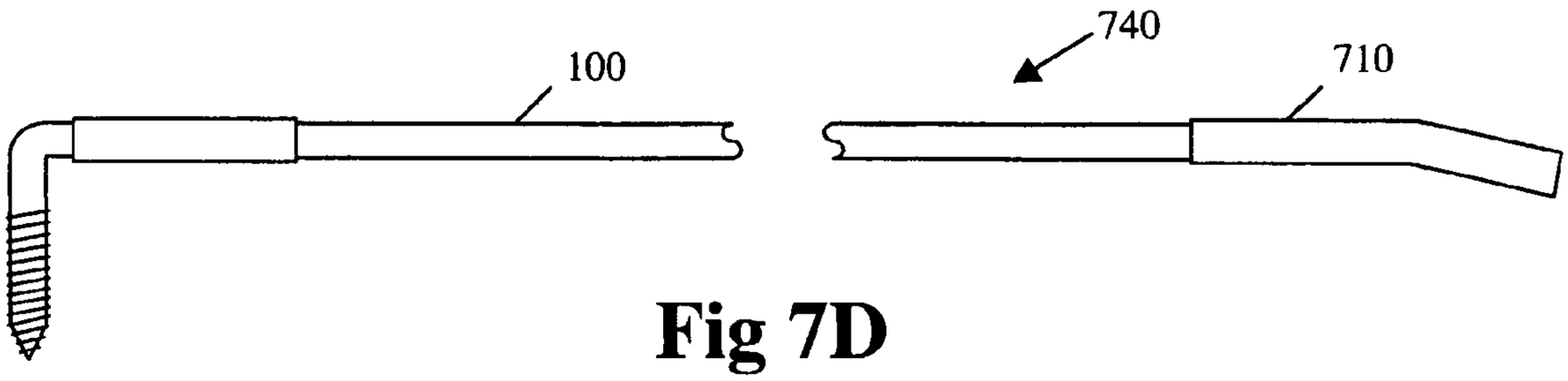


Fig 7D

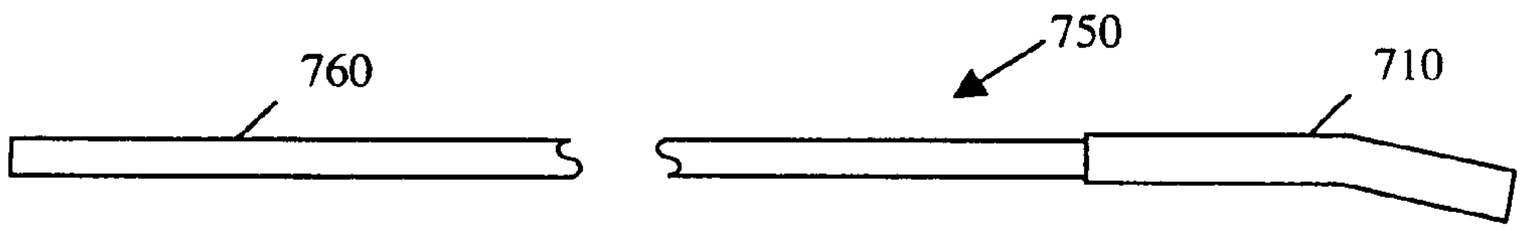


Fig 7E

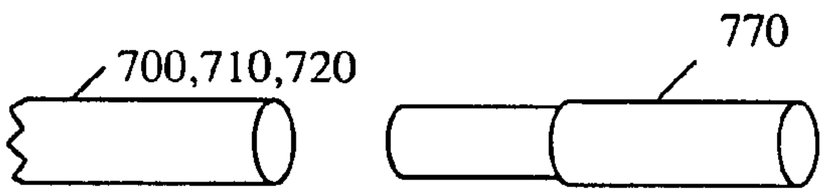


Fig 7F

Fig 7G

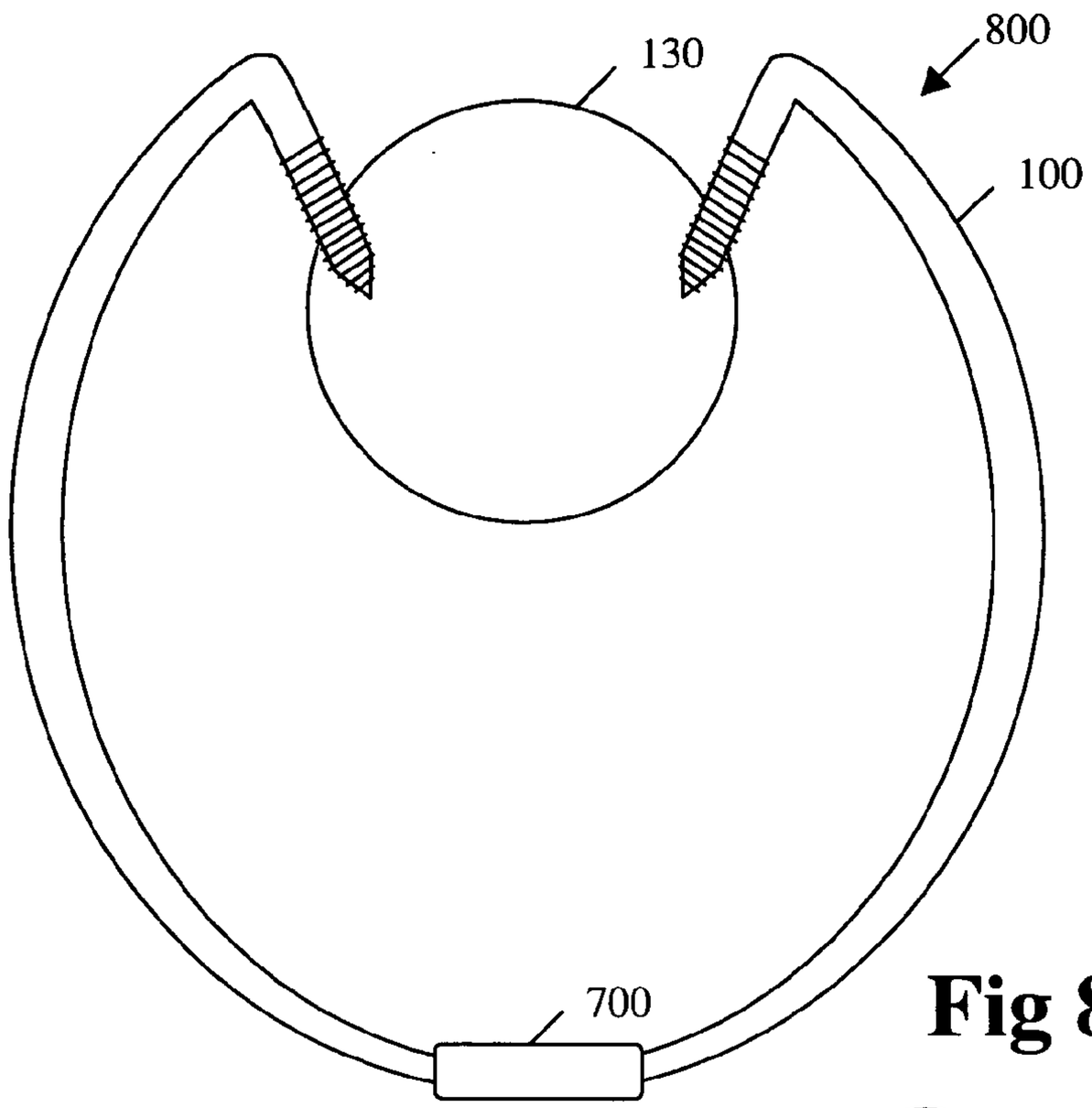


Fig 8A

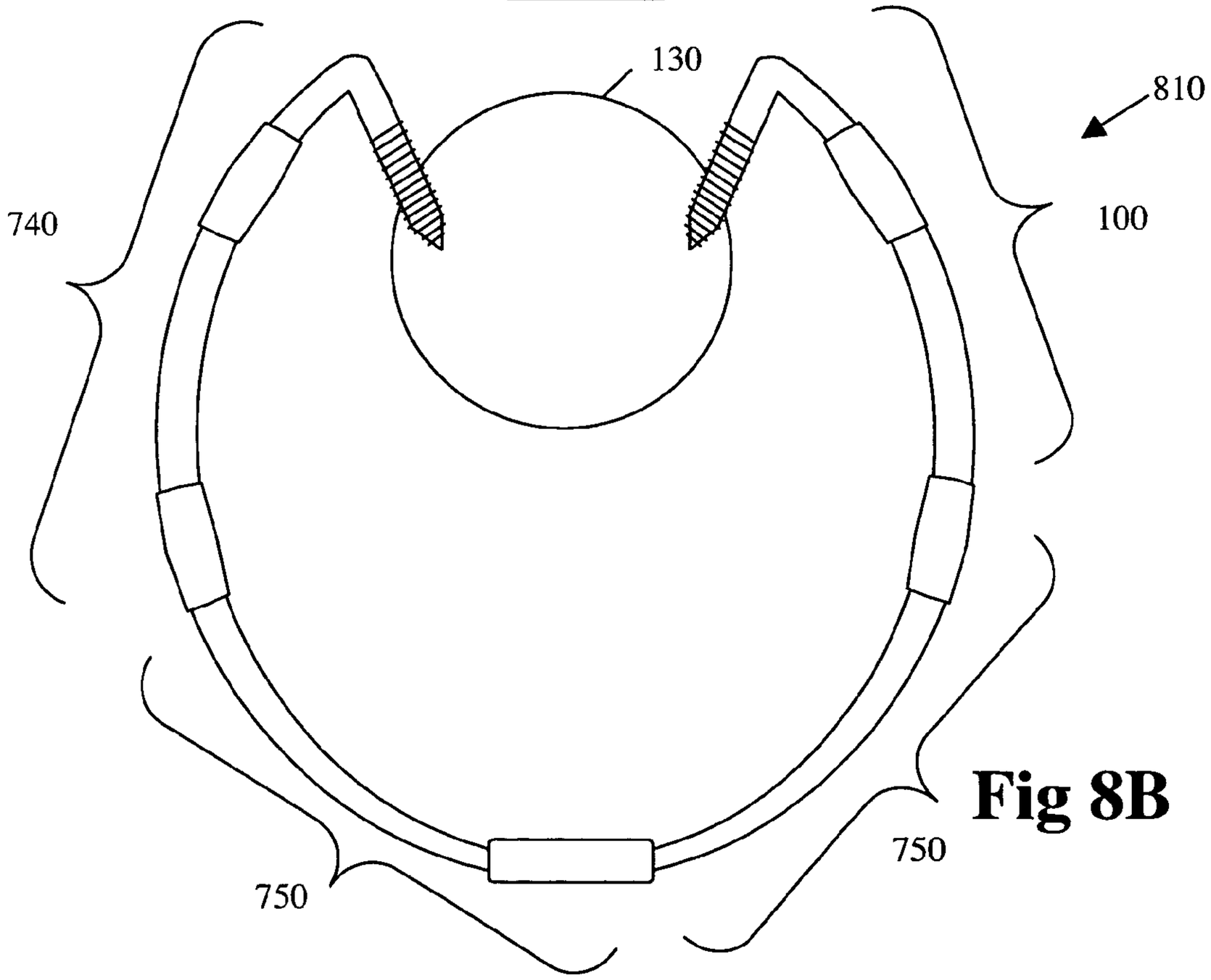


Fig 8B

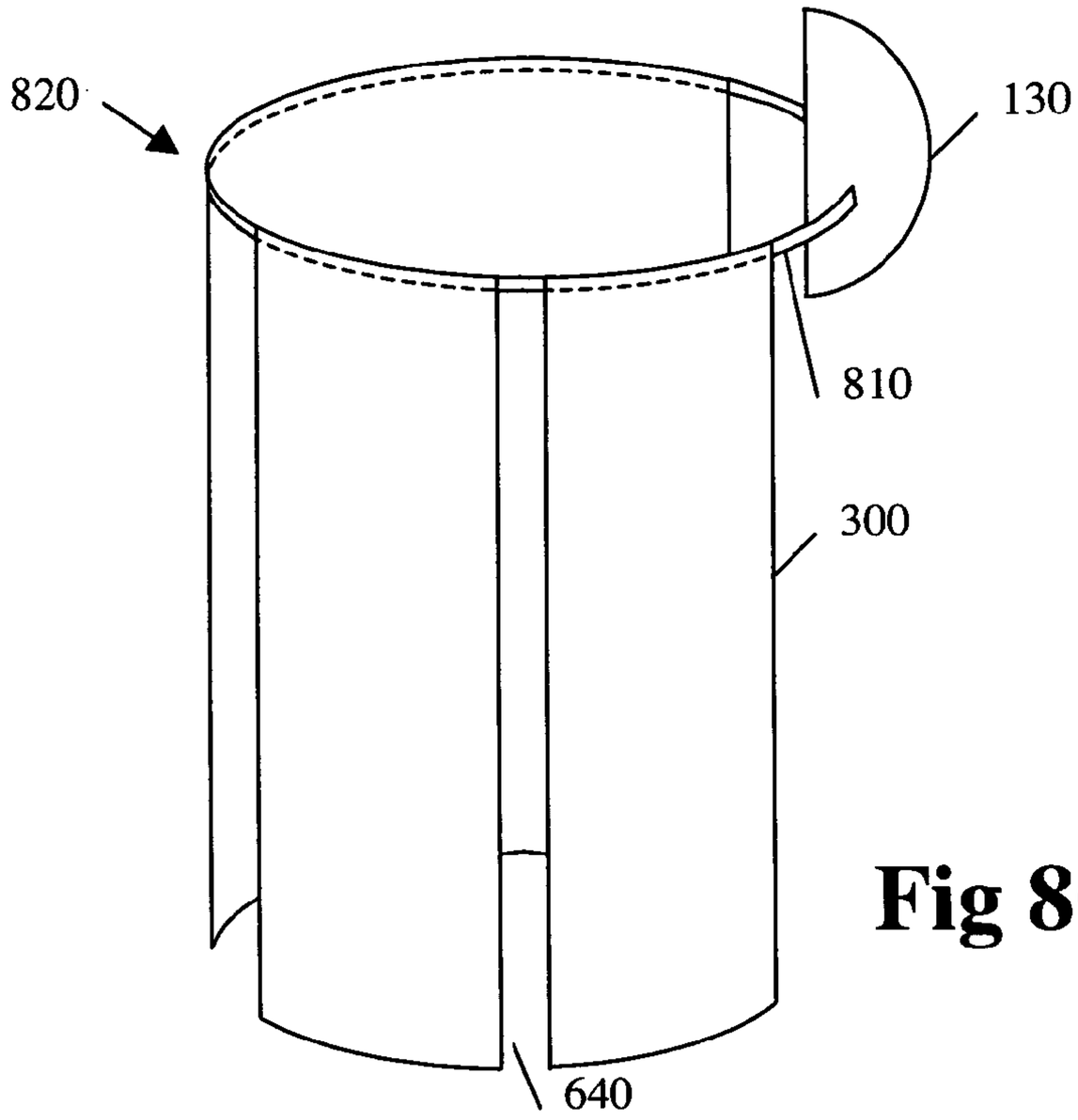
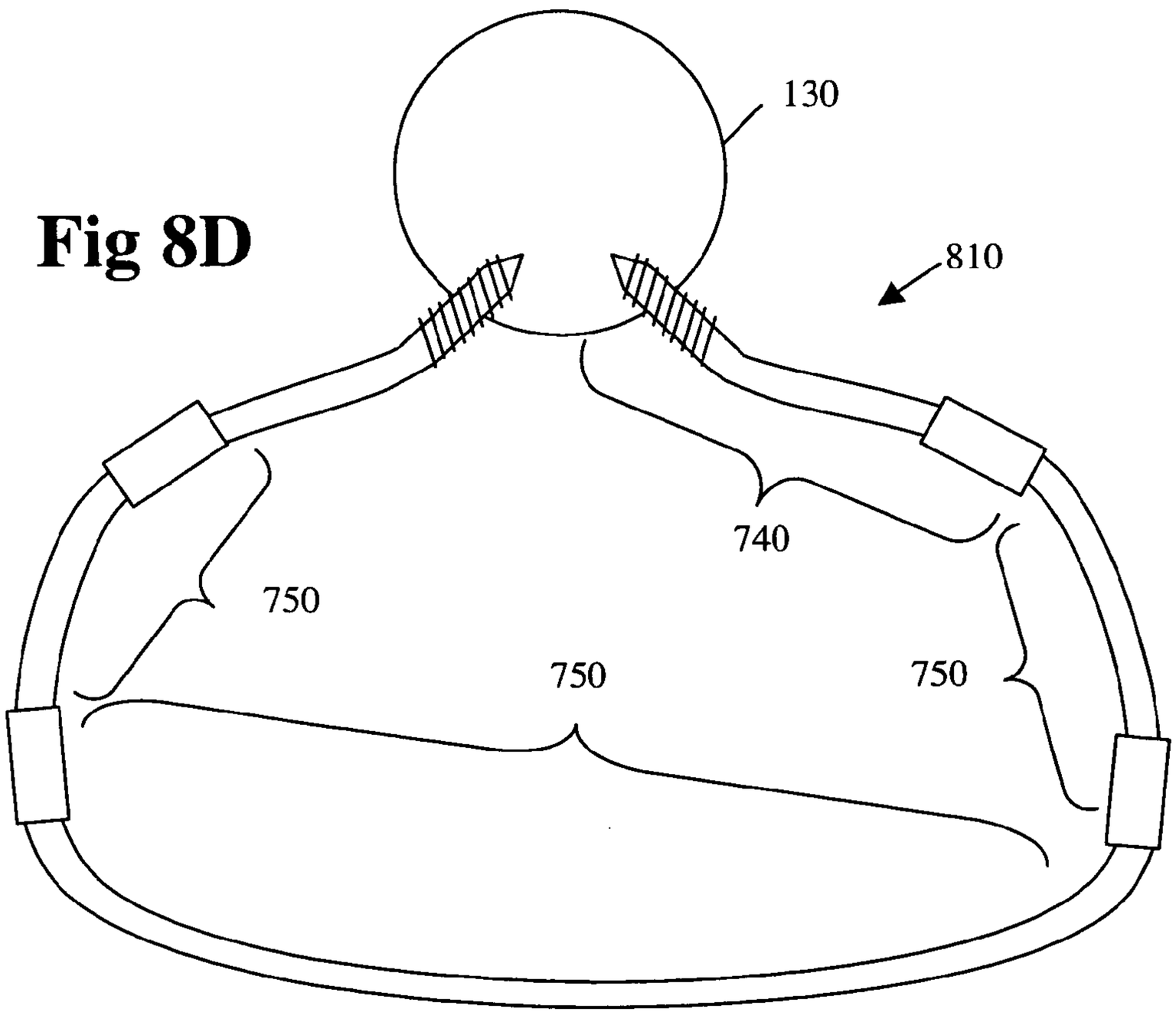


Fig 8C

Fig 8D



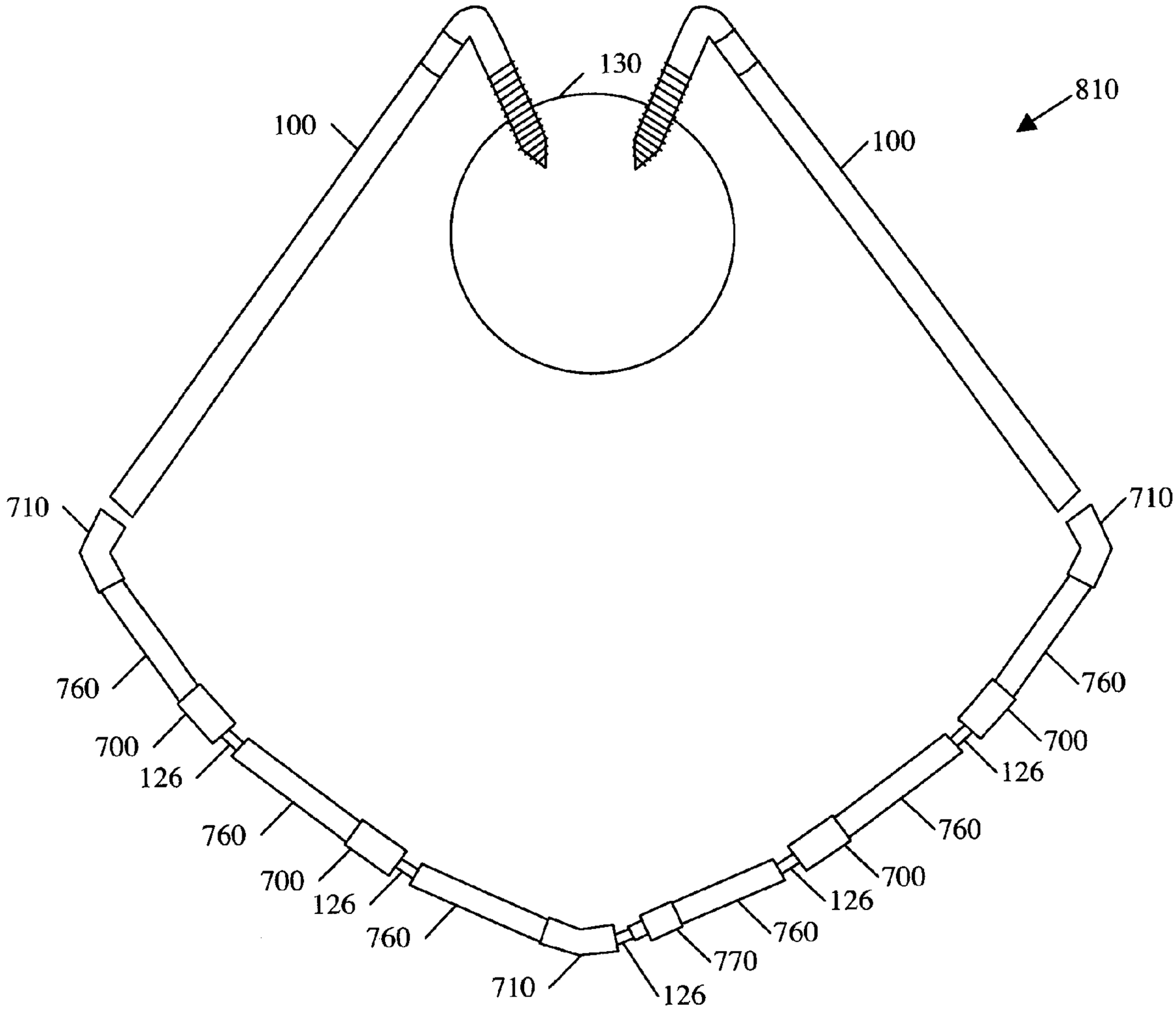

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Fig 8E

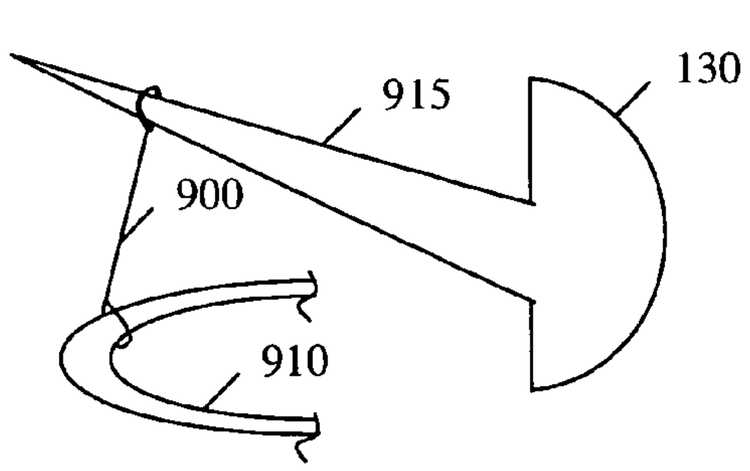


Fig 9A

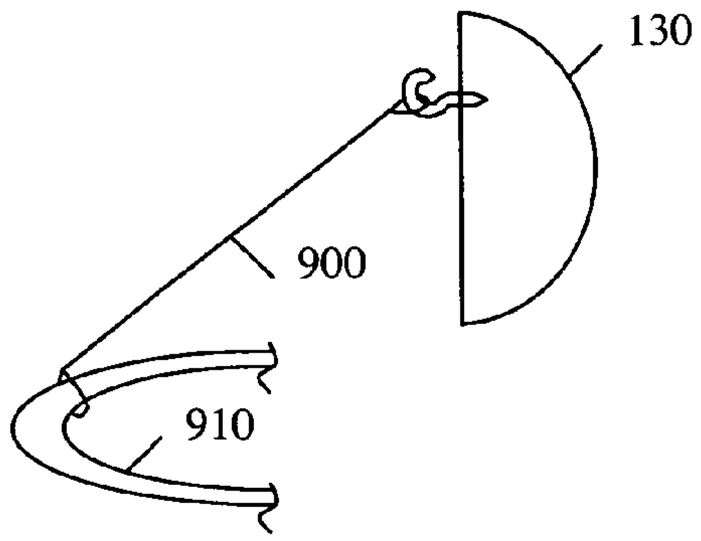


Fig 9B

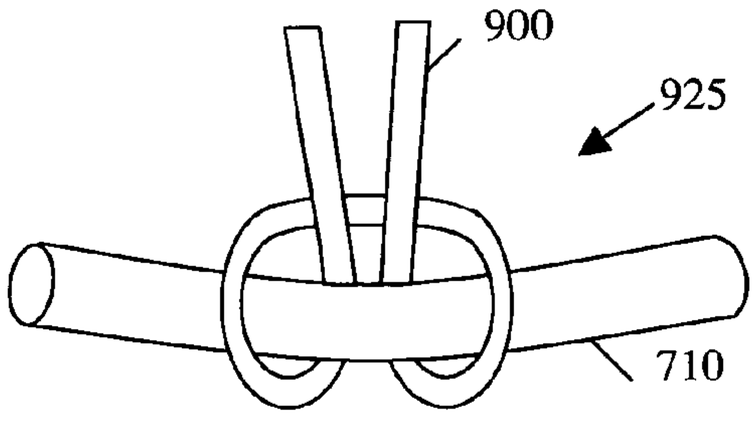


Fig 9C

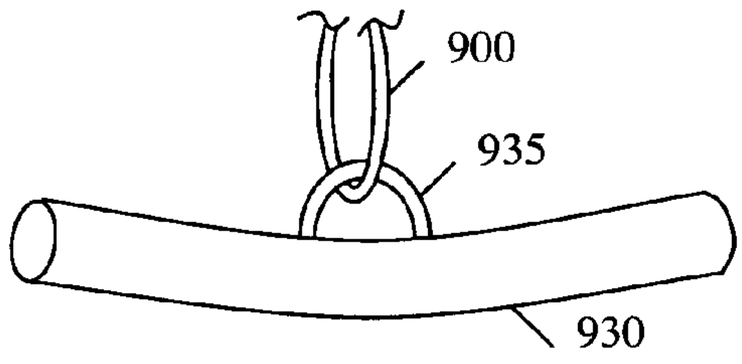


Fig 9D

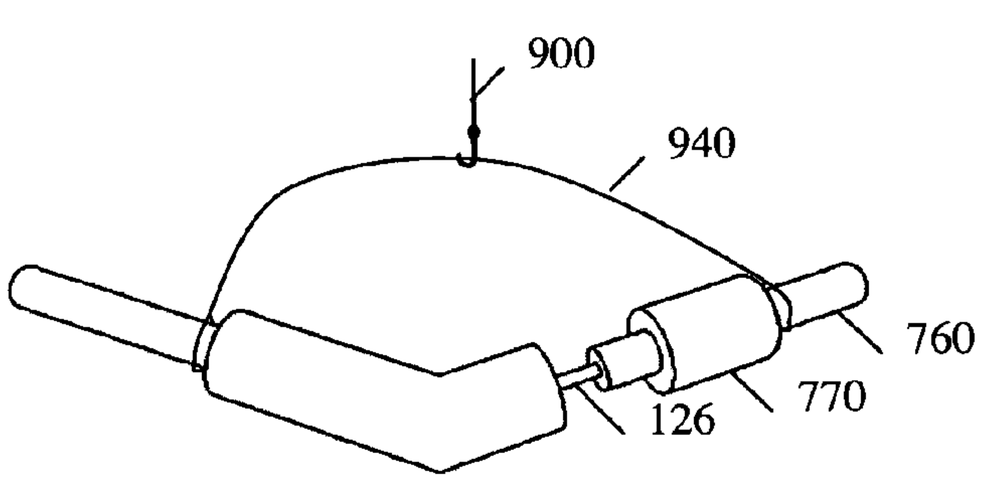


Fig 9E

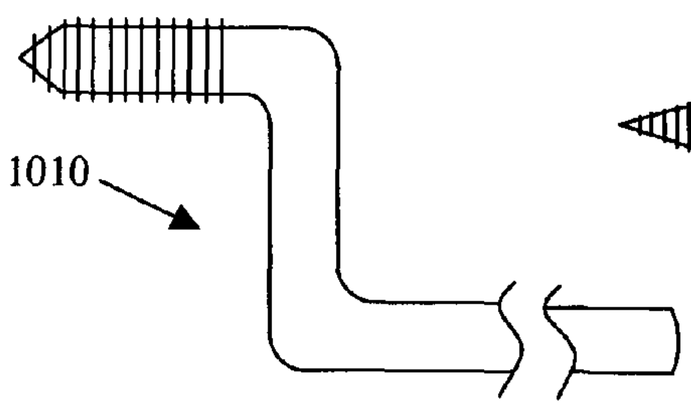


Fig 10A

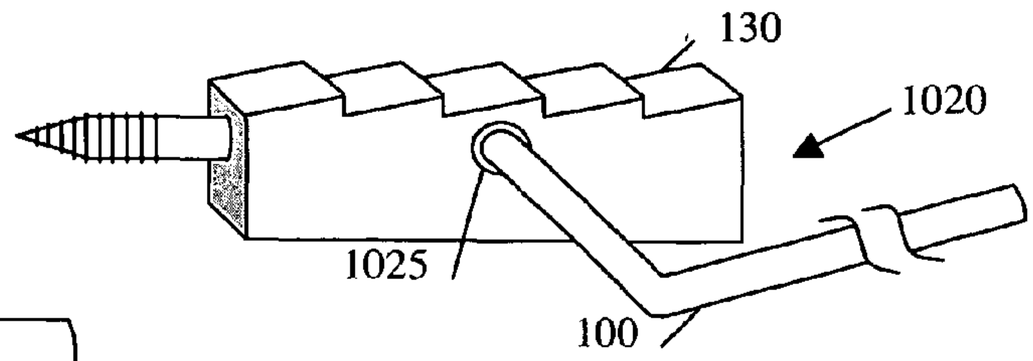


Fig 10B

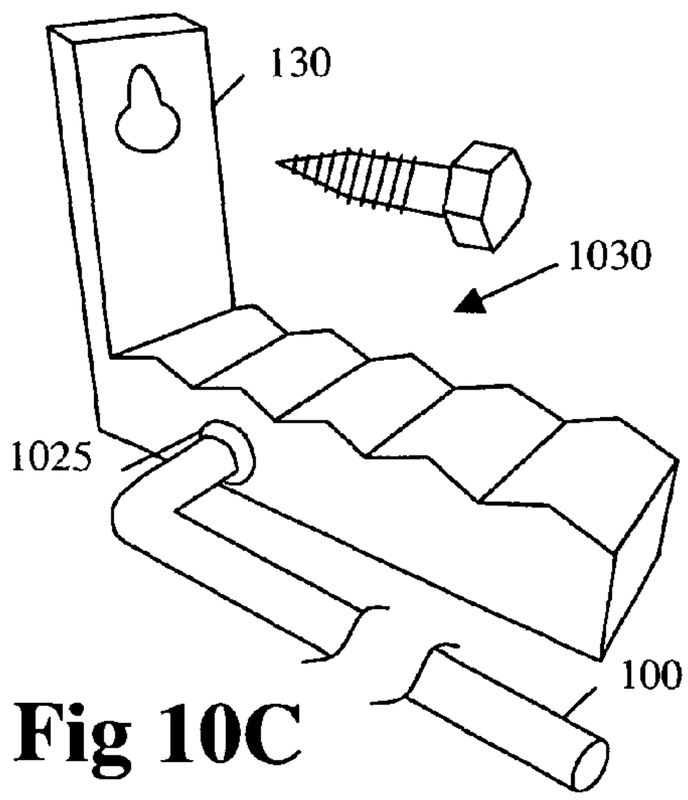


Fig 10C

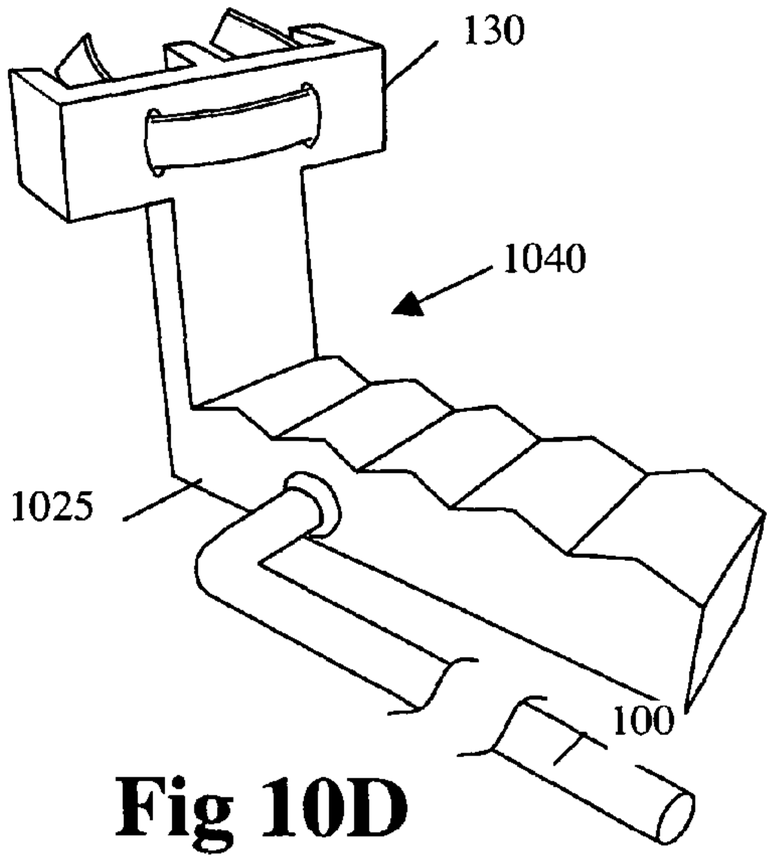


Fig 10D

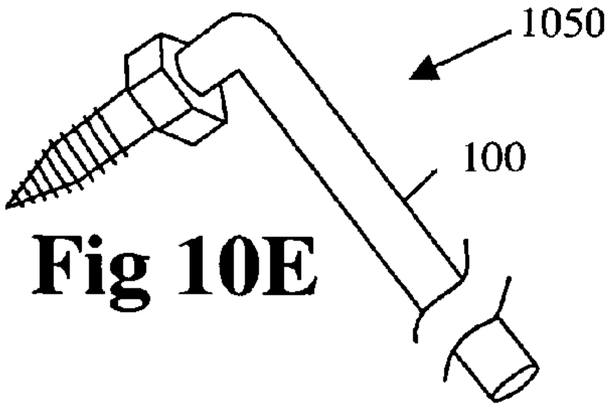


Fig 10E

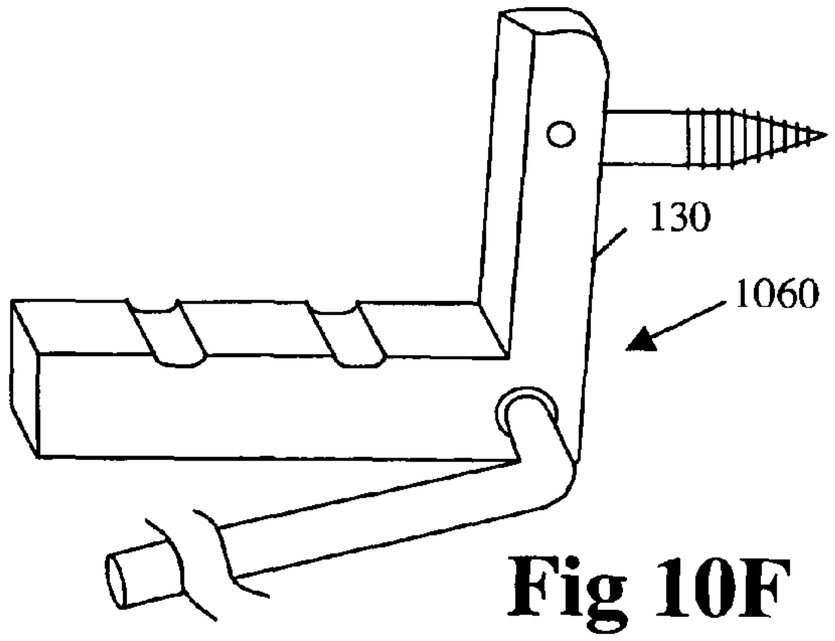


Fig 10F

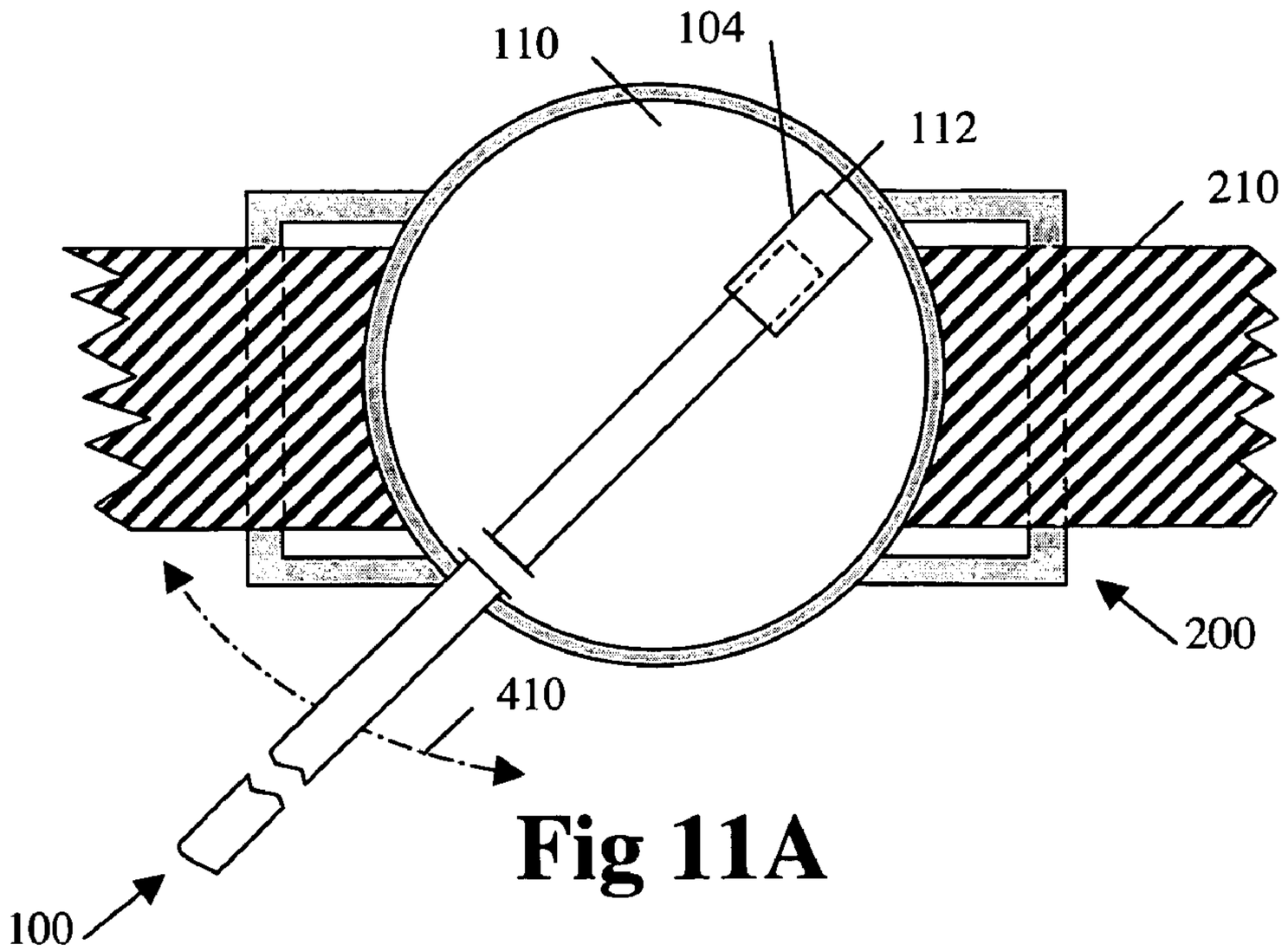


Fig 11A

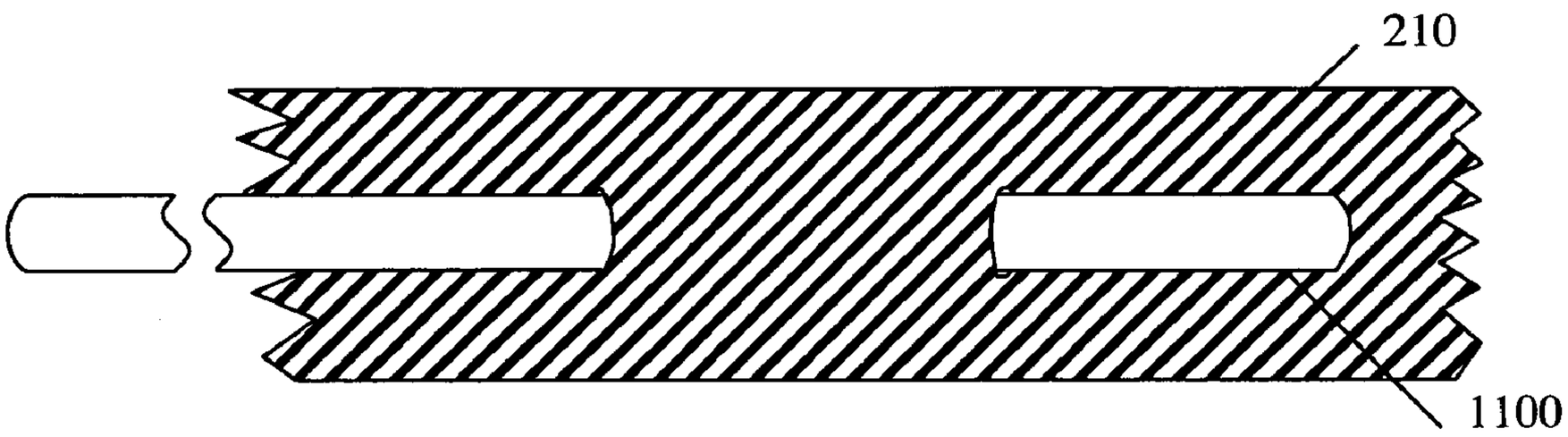


Fig 11B

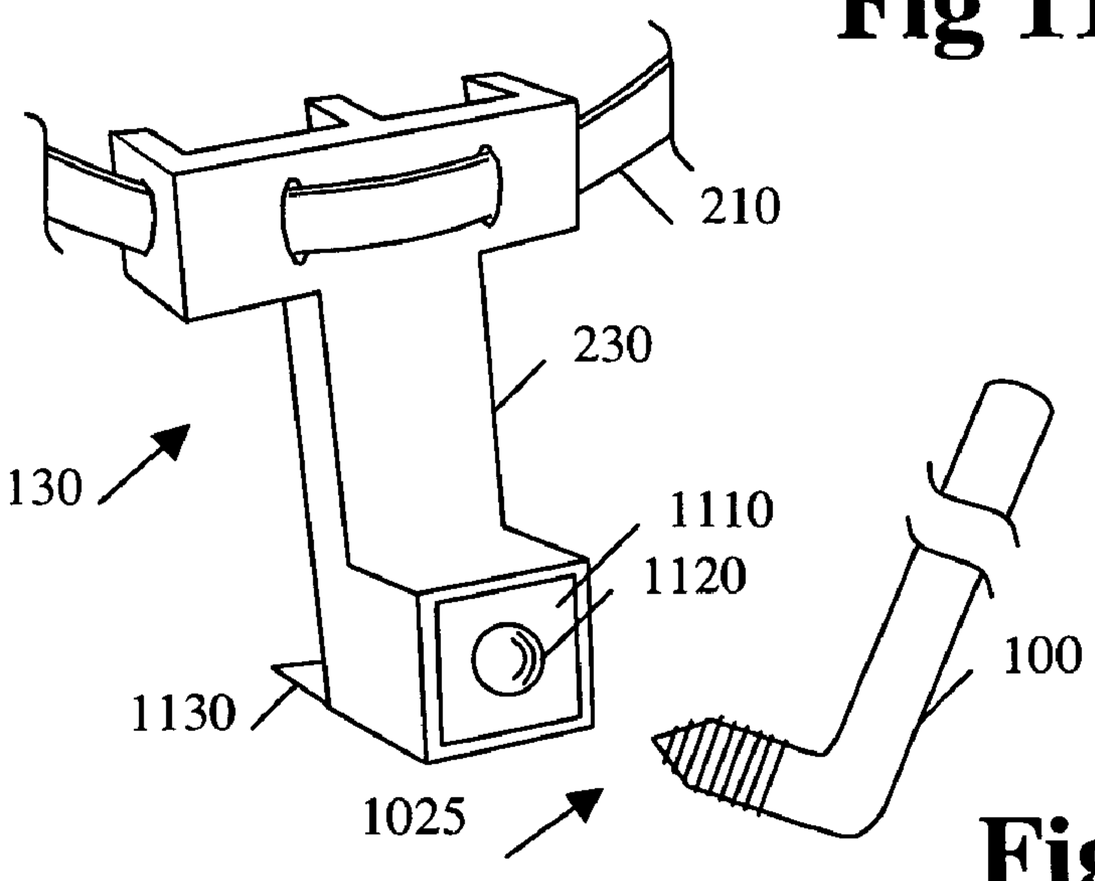


Fig 11C

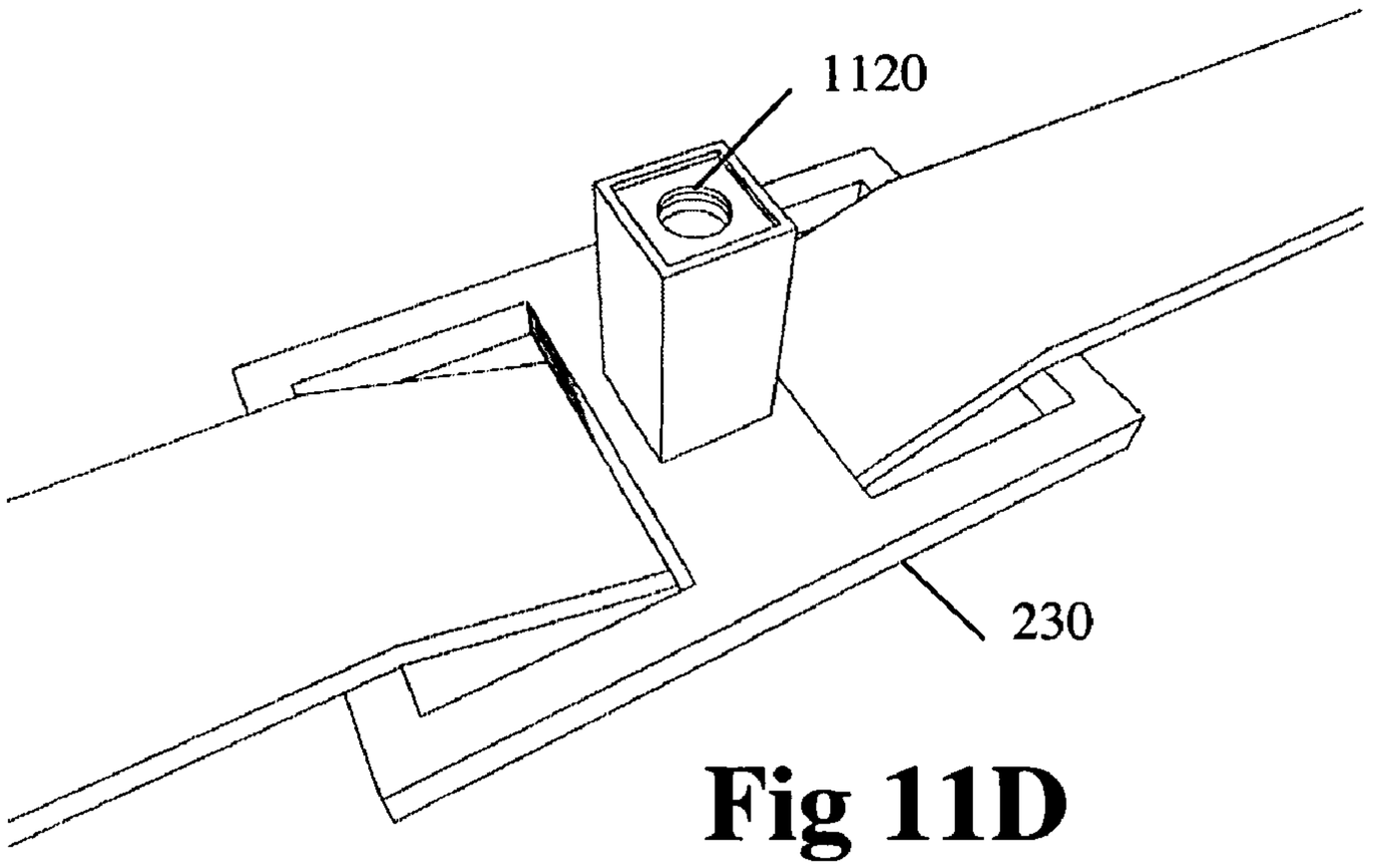


Fig 11D

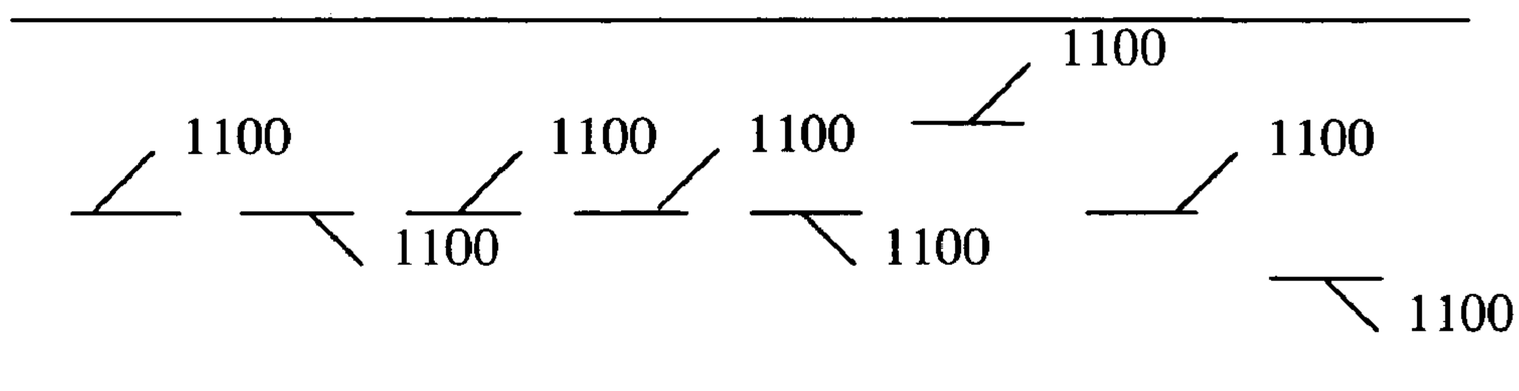


Fig 11E

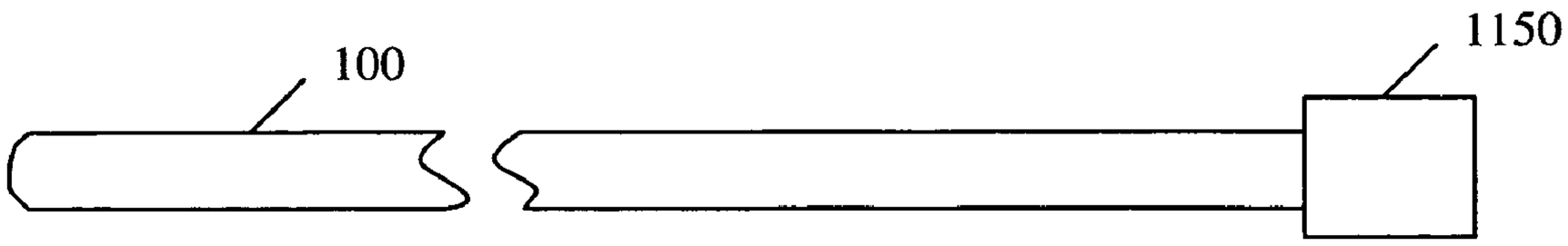


Fig 11F

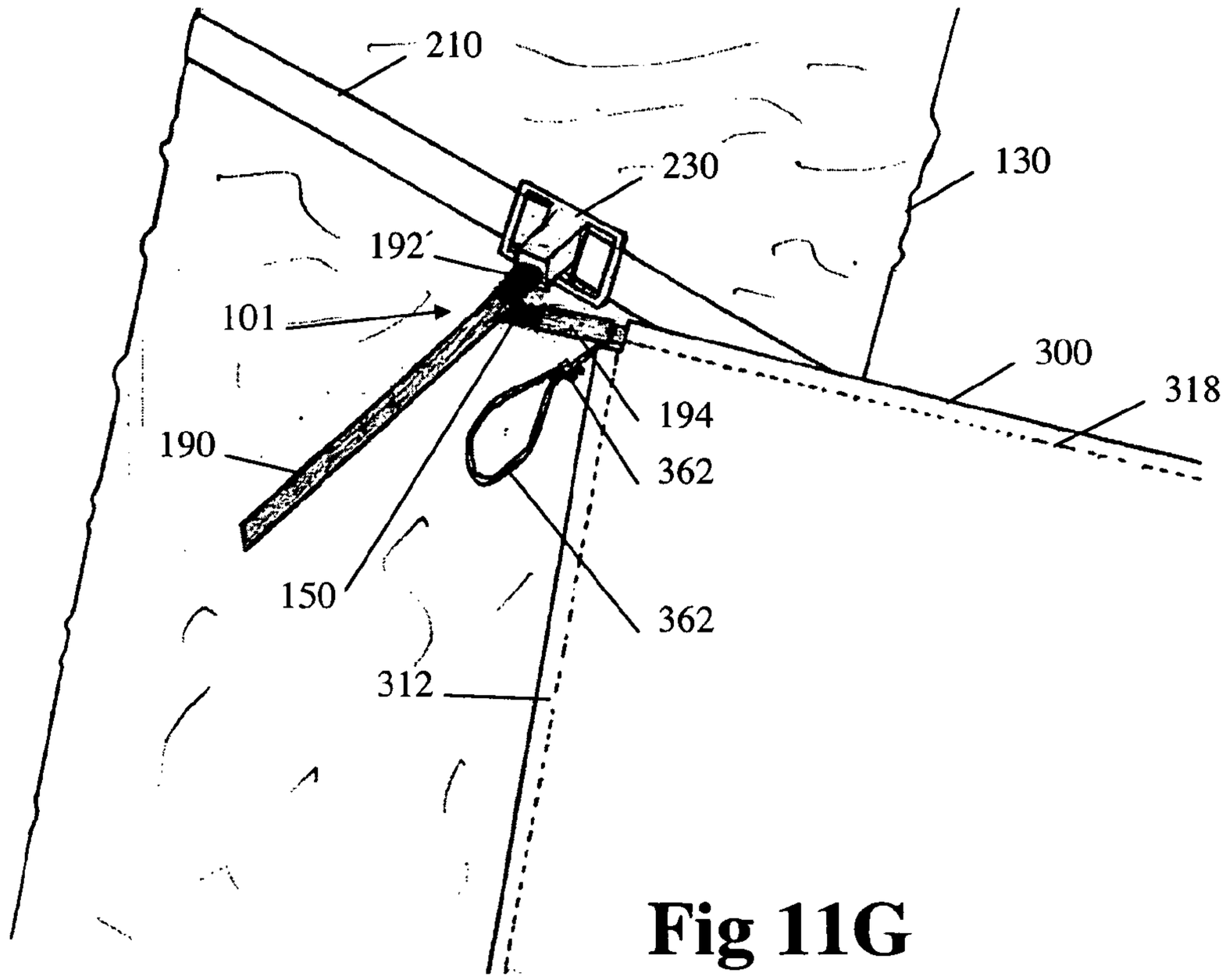


Fig 11G

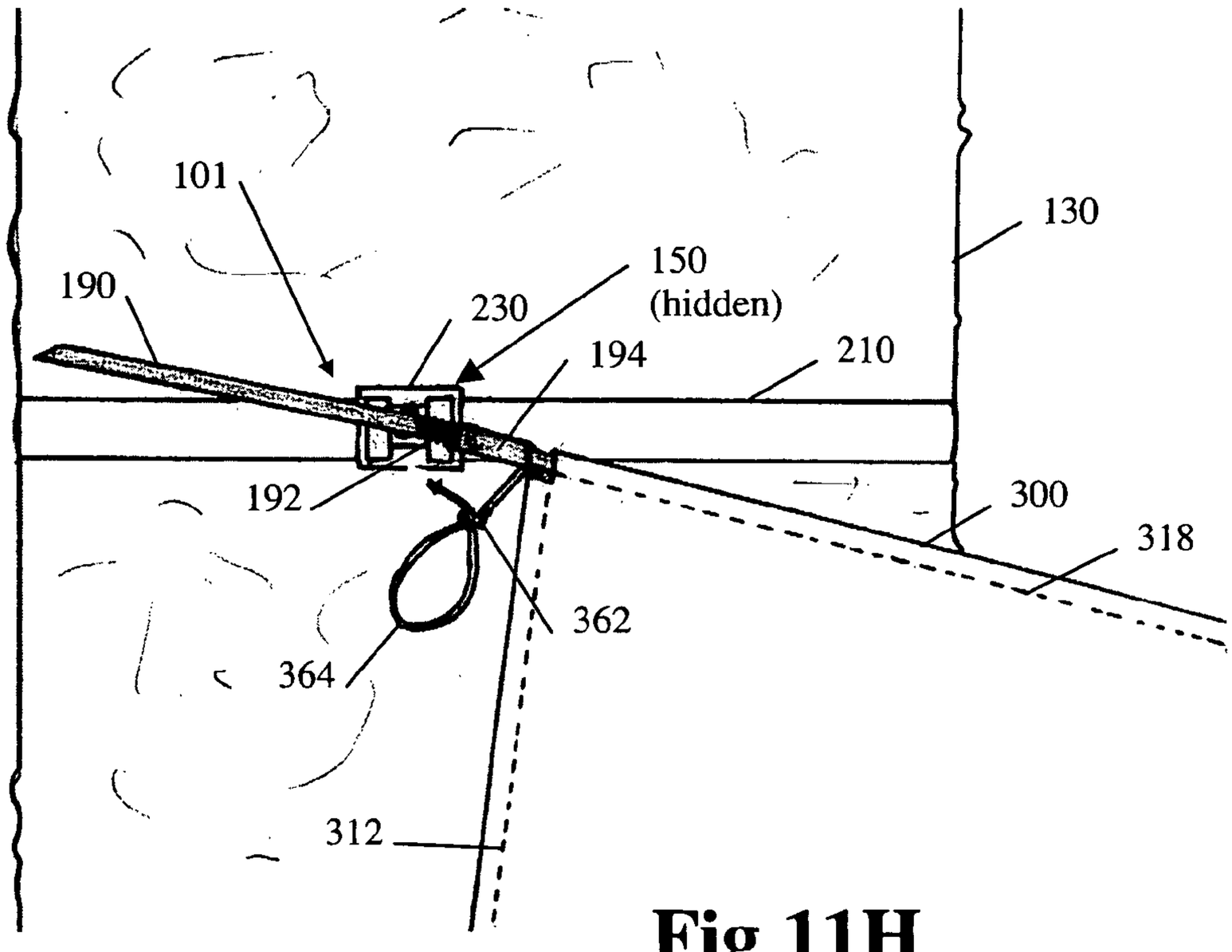


Fig 11H

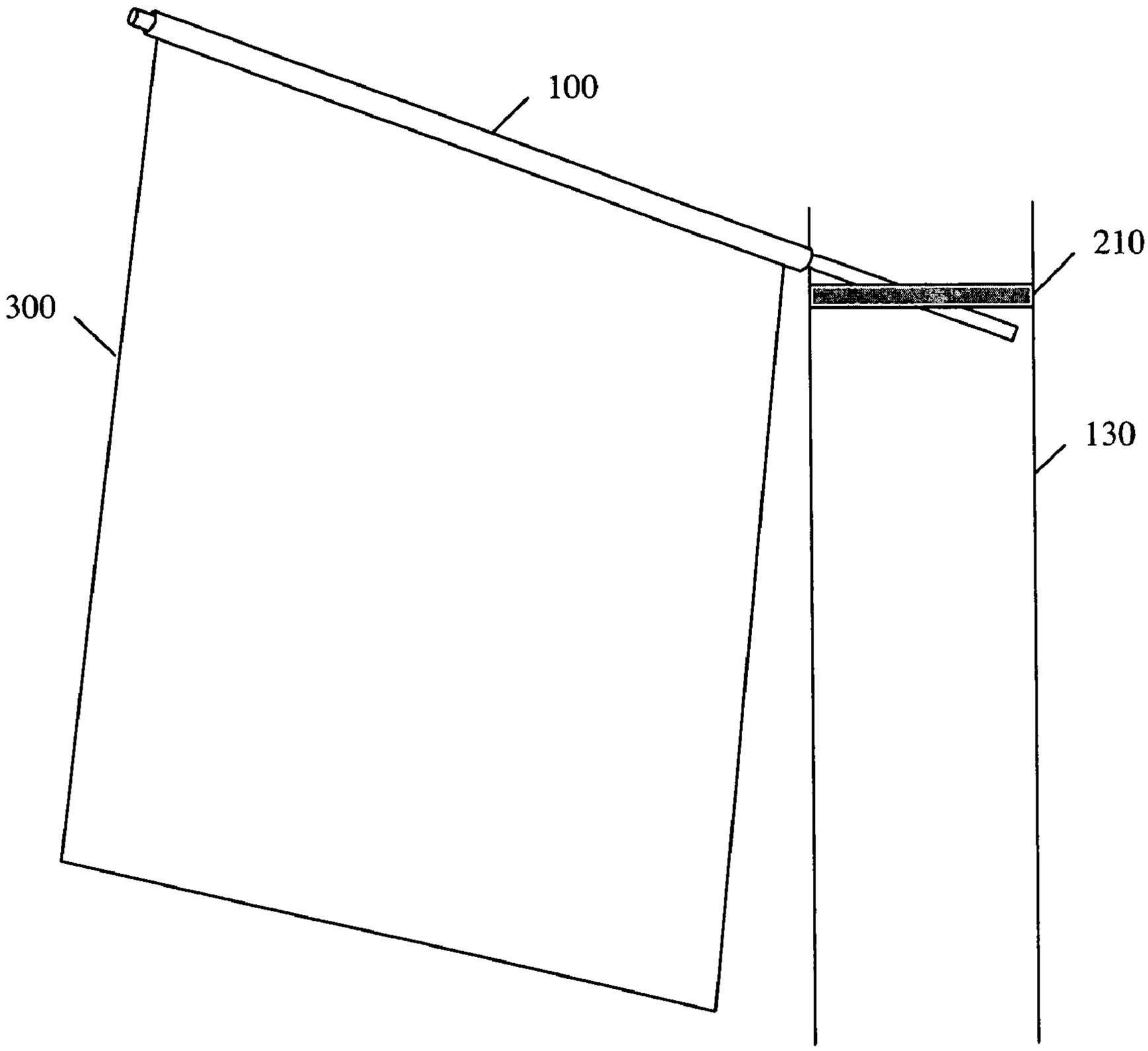
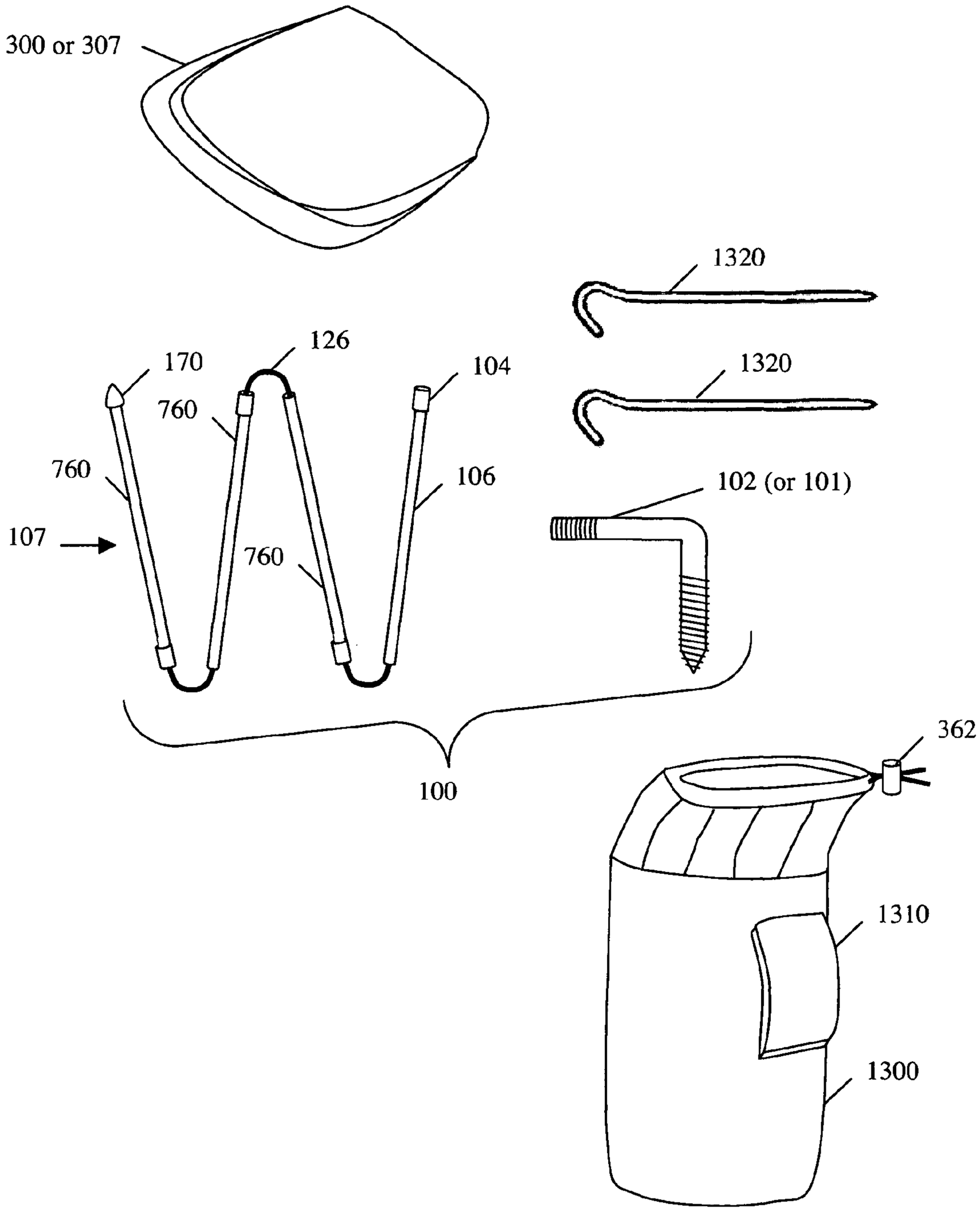


Fig 12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1310
1300

Fig 13

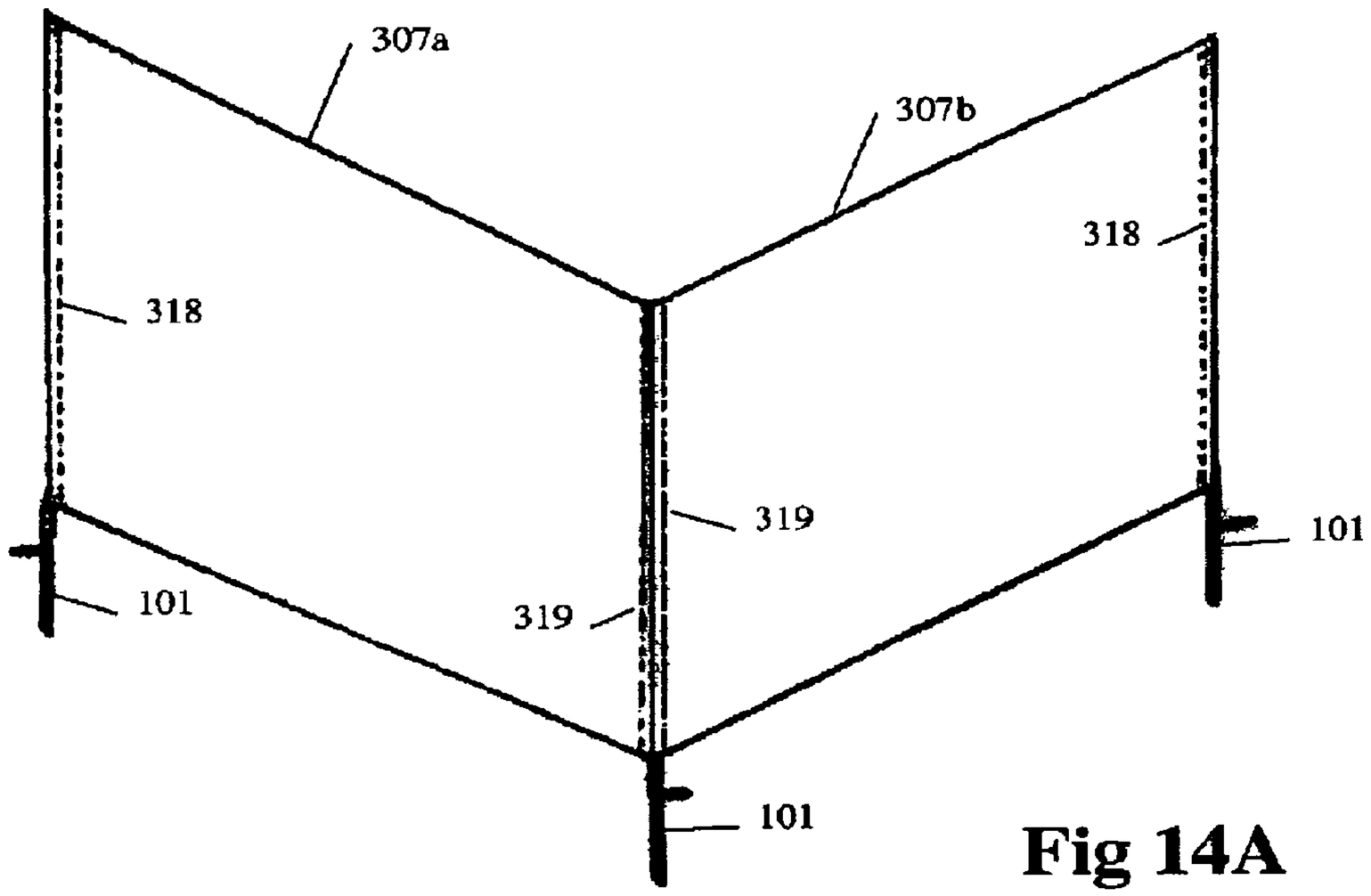

Fig 14A

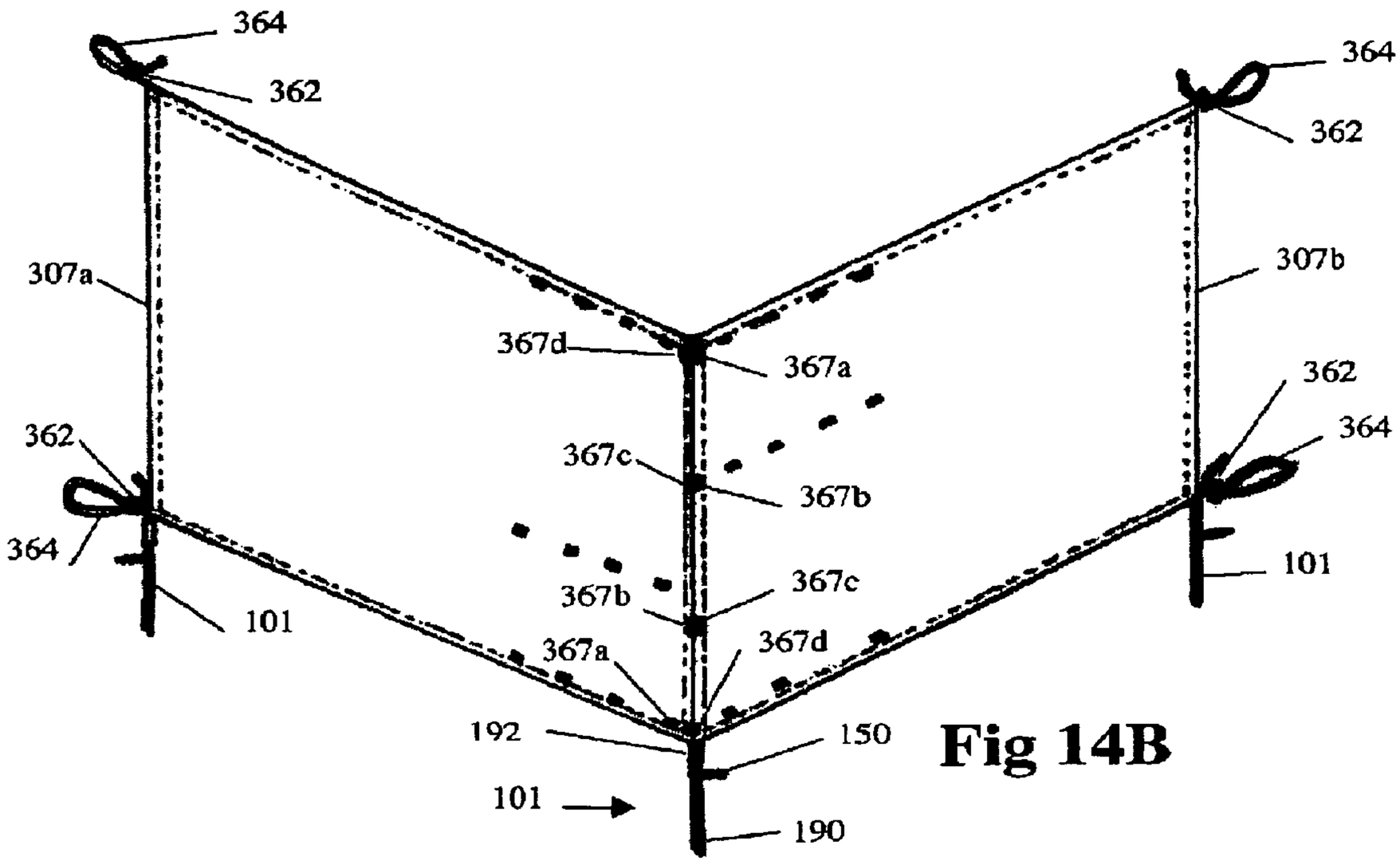

Fig 14B

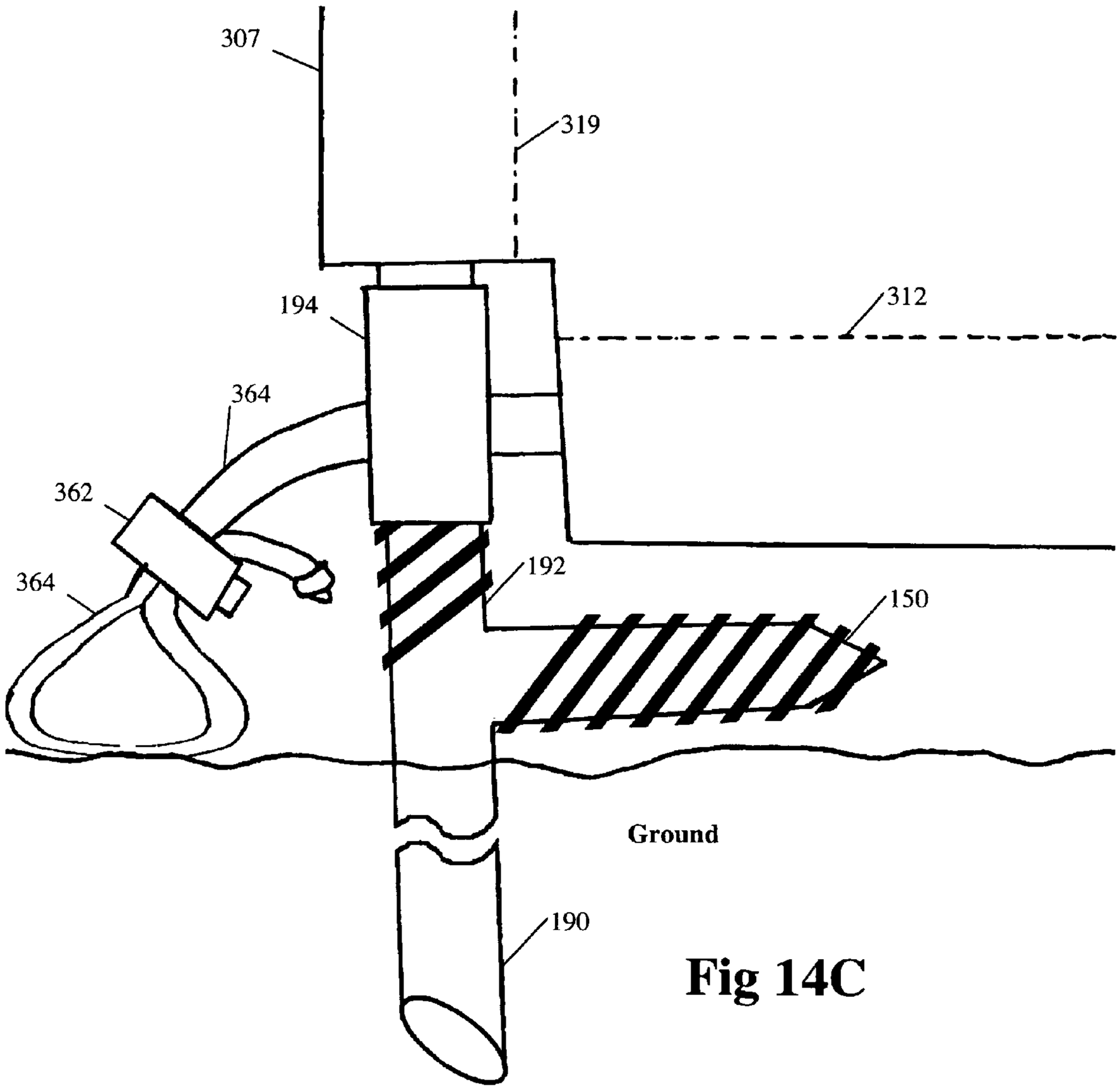

Fig 14C

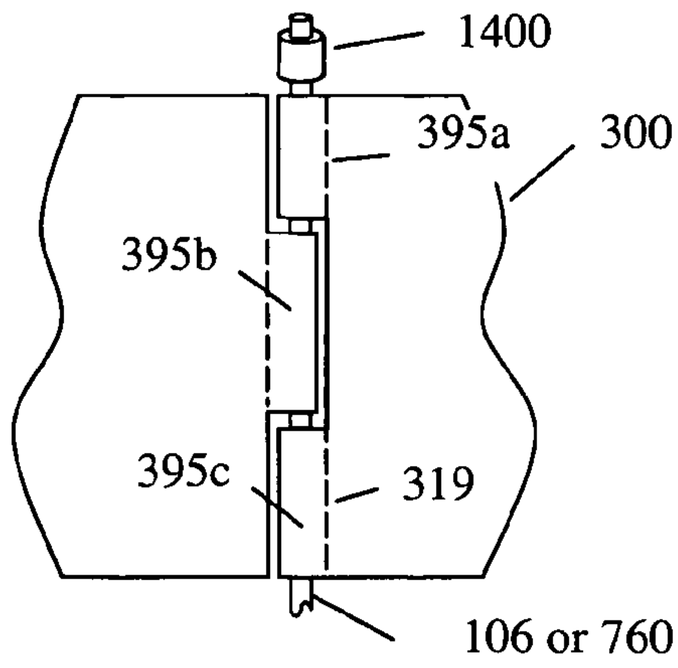

Fig 14D

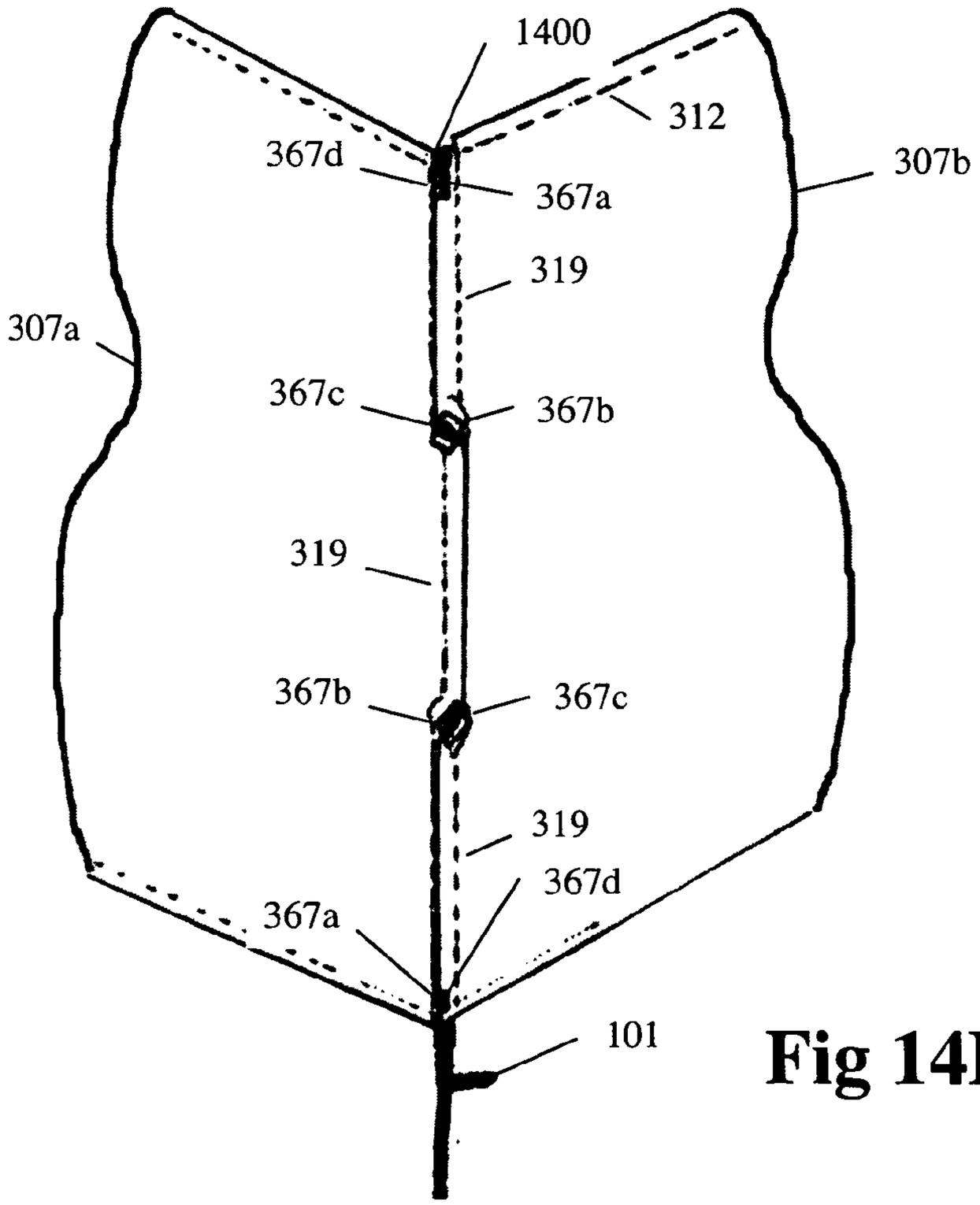

Fig 14E

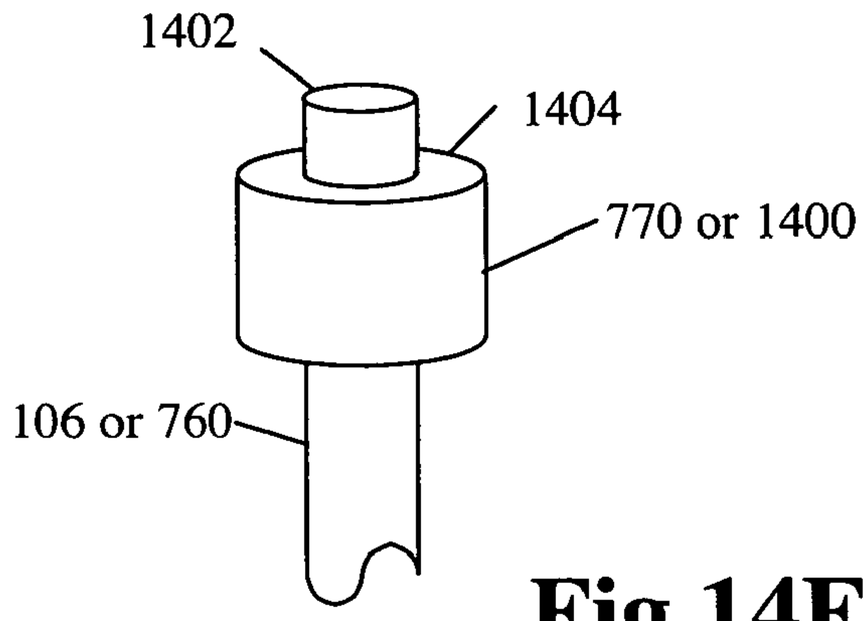

Fig 14F

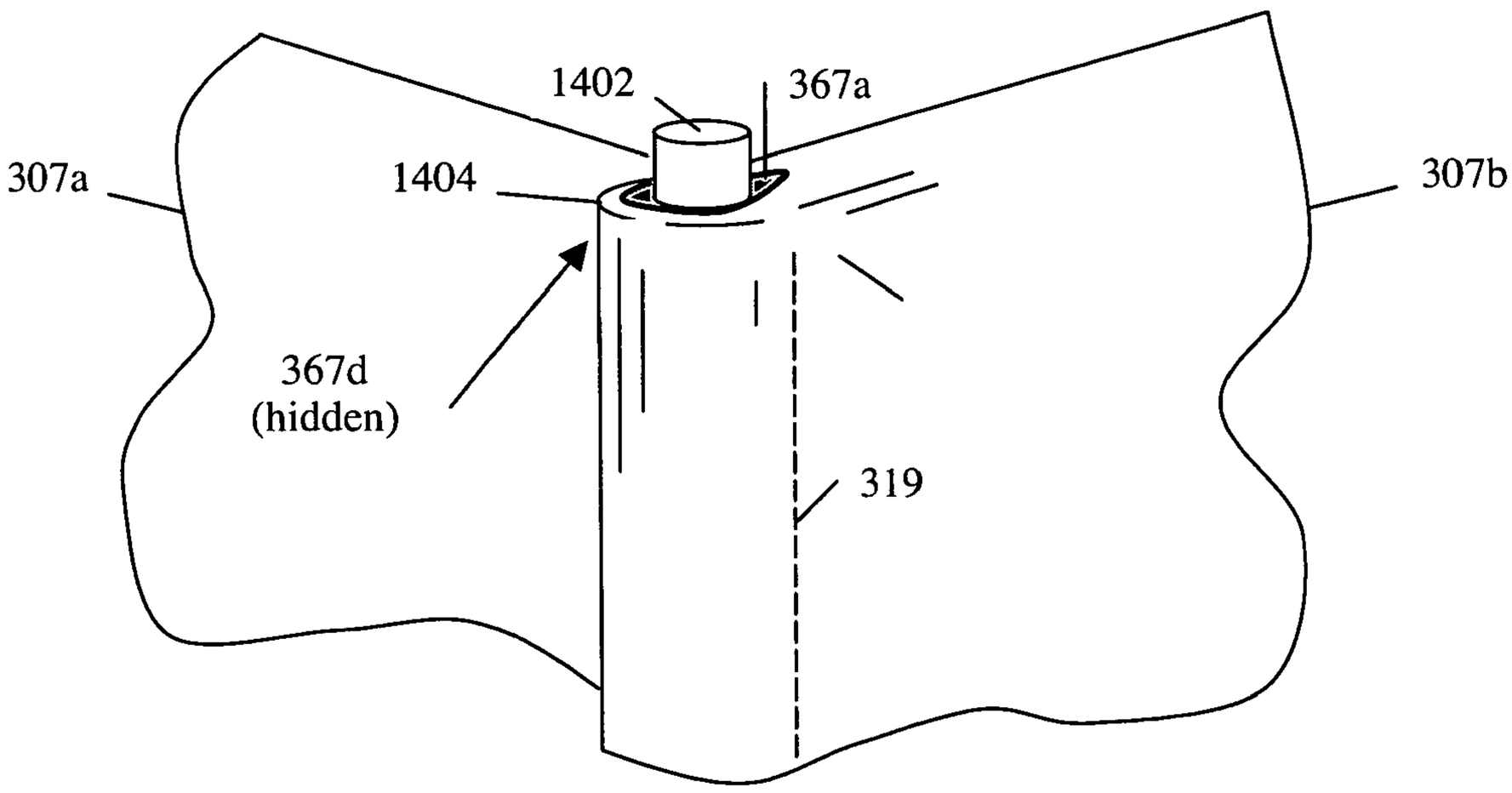

Fig 14G

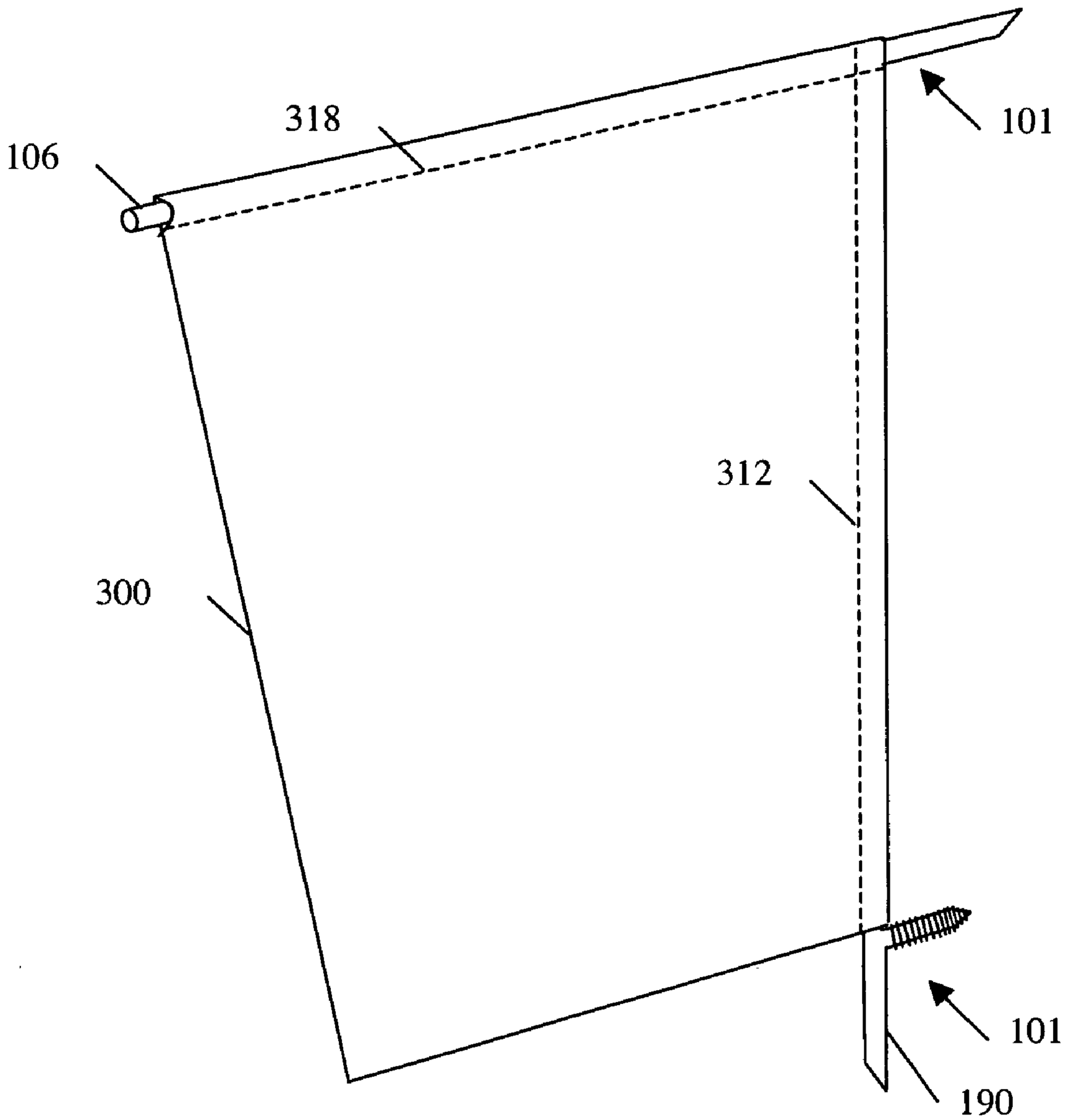

Fig 14H

UNIVERSAL LIGHTWEIGHT PORTABLE CONCEALMENT MEANS AND METHODS

RELATED APPLICATIONS

This application is a continuation-in-part of U.S. patent application Ser. No. 10/161,986, now U.S. Pat. No. 7,100,626 filed Jun. 4, 2002 and claims priority under 35 U.S.C. §119(b) of the U.S. provisional application Ser. No. 60/295,956, filed Jun. 4, 2001 entitled "LIGHTWEIGHT PORTABLE CONCEALMENT MEANS AND METHODS."

BACKGROUND

1. Field of the Invention

This invention relates to lightweight portable concealment devices and methods.

2. Description of Prior Art

There is often a need to conceal oneself when researching wildlife, hunting, camping, working on construction projects, or working in the outdoors. Wildlife researchers conceal themselves so that they can film and study wildlife without disturbing the behavior of the animals. Hunters often conceal themselves in various hunting blinds to avoid being detected by their prey. Campers often conceal themselves to bathe, change clothes, and perform other personal or hygiene activities. Construction workers, military, law enforcement, and others who work in the outdoors also have similar needs for concealment. Various methods have been employed to accomplish these tasks.

In the past, quite complex, heavy structures have been built or constructed for concealment. Hunters have built permanent hunting blinds. Portable huts, shower stalls, dressing shelters, tents, canopies, and complex tree blind structures have been carried into the great outdoors.

The following is a list of patents relating to this field of invention:

U.S. Pat. No. 5845665	Demountable structure
U.S. Pat. No. 5836330	Suspended overhead canopy assembly and method thereof
U.S. Pat. No. 5630439	Portable hut
U.S. Pat. No. 5613512	Blind structure for use with tree stand
U.S. Pat. No. 4825578	Portable blind apparatus
U.S. Pat. No. 4813441	Camouflage device for hunter's seat
U.S. Pat. No. 4719934	Stable lightweight shelter structure
U.S. Pat. No. 4505286	Portable shelter
U.S. Pat. No. 4597401	Light weight tent
U.S. Pat. No. 4449542	Portable hunting blind
U.S. Pat. No. 5385165	Hunting blind
U.S. Pat. No. 4926892	Temporary enclosing structure
U.S. Pat. No. 3913598	Hunter's blind and shelter
U.S. Pat. No. 5628338	Collapsible blind
U.S. Pat. No. 4788997	Portable blind
U.S. Pat. No. 5361794	Unitized foldable tent frame
U.S. Pat. No. 4751936	Portable field blind
U.S. Pat. No. 5669403	Hunting blind adapted to be mounted in a tree
U.S. Pat. No. 5822906	Pit blind for interacting with wildlife and method of installation and use thereof
U.S. Pat. No. 5803694	Portable tree platform elevated with a winch
U.S. Pat. No. 5528849	Camouflage tube, a portable camouflage concealment structure
U.S. Pat. No. 5377711	Camouflage blind for hunters
U.S. Pat. No. 3690334	Portable hunting blind
U.S. Pat. No. 5127180	Camouflage device for archery bow
U.S. Pat. No. 5062234	Portable blind
U.S. Pat. No. 4716919	Portable blind with automatic opening top
U.S. Pat. No. 4683672	Collapsible game blind
U.S. Pat. No. 3545461	Tree suspended enclosure
U.S. Pat. No. 3925828	Portable shower

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U.S. Pat. No. 5970536	Camp shower apparatus
U.S. Pat. No. 5311620	Outdoor portable shower
U.S. Pat. No. 5446930	Portable shower enclosure
U.S. Pat. No. 5564138	Portable shower
U.S. Pat. No. 5937452	Portable bathroom assembly

The use of such devices has several disadvantages such as being heavy, bulky, noisy, expensive, and complicated to assemble or use. Most of these devices have only a single use with poor performance. There is a need for a simple, lightweight, compact, portable, multi-use means of concealment.

To avoid being detected by their scent, hunters and other wildlife observers climb trees using tree steps and then remain for hours in a tree stand watching and waiting for animals to pass by. However, a person in a tree stand makes a silhouette against the sky or background and is exposed to a 360 degree view. Animals can easily detect the human silhouette or movement. Further, if the person or equipment makes a noise the animal will know where to look. There is a need for a device that eliminates the silhouette.

Complicated equipment or procedures create a situation where a person may drop equipment or, even worse, fall from the tree stand. Most of the existing devices block the view or mobility of the person.

Metal objects screwed into trees are sometimes forgotten and become over grown by the tree. Later when the lumber is harvested and cut, the saw strikes the metal object and can cause severe damage. Some states have banded the use of metal tree screws or spikes. Any device used for attaching to trees in the forest needs an embodiment that attaches to the outside of the tree and can be easily removed.

The following ground blinds are known in the art:

Hunter's Specialties' "Lightweight Portable Ground Blind"

Avery' "Avery Quick Carry Ground Blind"

U.S. Pat. No. 5,062,234, entitled "Portable Blind"

However, these ground blinds are limited in that they are designed for a single use or application.

The following is a list of patents relating to curtain support brackets:

U.S. Pat. No. 891622	Curtain Fixture
U.S. Pat. No. 926945	Curtain Rod
U.S. Pat. No. 1079431	Curtain Pole
U.S. Pat. No. 1298634	Window Curtain Hanger
U.S. Pat. No. 1435110	Curtain Holder
U.S. Pat. No. 1528910	Curtain Bracket
U.S. Pat. No. 1572845	Curtain Support
U.S. Pat. No. 2175501	Curtain-Rod Support

However, these are old references associated with hanging curtains inside a building on a wall and fail to anticipate many novel features of the present invention.

SUMMARY OF THE INVENTION

Accordingly, it is an objective of the present invention to provide an easy to use, universal, simple, lightweight, compact, portable, quiet, multi-use means of concealment.

OBJECTS AND ADVANTAGES

Accordingly, beside the objects and advantages described above, some additional objects and advantages of the present invention are:

1. To provide an improved wildlife research blind.
2. To provide an improved hunting blind.
3. To provide an improved outdoor shower concealment means.
4. To provide an improved outdoor latrine concealment means.
5. To provide an improved tree stand concealment means.
6. To provide a quick, silent means of lowering or raising a screen.
7. To provide a pivotal means of attachment that maintains its frictional force.
8. To provide an option for attaching to the outside of a tree.
9. To provide unobstructed vision or shooting lanes.
10. To provide a means of concealment by hiding in front of a similar pattern.
11. To provide a system that can be used as a ground blind as well as a tree blind.
12. To provide a universal support with multiple legs which can be used with a curtain to form various configuration to meet the needs of various environments and uses.
13. To provide improved means of construction with lower cost and longer reliability.

These and other features and advantages of the present invention will become apparent upon consideration of the following specification, claims, and drawings.

DRAWING FIGURES

In the drawings, closely related figures have the same number but different alphabetic suffixes.

FIG. **1**A through FIG. **1**H show various embodiments of the support of the present invention.

FIGS. **1**I through **1**M show various embodiments of the alternate support of the present invention.

FIG. **1**L through FIG. **1**M show details of the alternate support.

FIG. **1**N through FIG. **1**R show various embodiments of the alternate dimpled connector.

FIG. **2**A and FIG. **2**B show the support attached to an attaching support.

FIG. **2**C and FIG. **2**D show views of the embodiment of FIG. **2**B.

FIG. **3**A shows the support combined with a curtain.

FIG. **3**B through FIG. **3**L show details of curtain embodiments.

FIG. **3**M shows an alternate curtain embodiment.

FIGS. **4**A through **4**E show exemplary uses of the present invention.

FIG. **4**F shows exemplary use of the alternate support embodiment.

FIG. **5**A through FIG. **5**C show embodiments of curtain attachments.

FIG. **6**A through FIG. **6**D show T-shaped embodiments of the present invention.

FIG. **7**A through FIG. **7**G show connectors and their use.

FIG. **8**A through FIG. **8**E show loop support embodiments.

FIG. **9**A through FIG. **9**E show details of loop support with a supporting cord.

FIG. **10**A through FIG. **10**F show alternate embodiments.

FIG. **11**A through FIG. **11**H show alternate embodiments.

FIG. **12** shows an alternate embodiment.

FIG. **13** shows an exemplary lightweight portable embodiment.

FIG. **14**A and FIG. **14**B show ground blind embodiments.

FIG. **14**C though FIG. **14**H shows details of the ground blind embodiments.

REFERENCE NUMERALS IN DRAWINGS

100	attaching pivoting support
101	alternate support
102	threaded support
104	threaded connector
106	shaft
107	segmented shaft
108	telescoping shaft
110	plate
112	plate connection
114	plate sleeve
120	drilled support
122	drilled receiving shaft
124	fastener
126	elastic cord
126a	cord
126b	cord attachment or knot
130	attaching structure
140	bend
150	first leg
160	second leg
170	cap
180	horizontal structure
190	third leg
192	alternate second leg
194	dimpled connector
194a	spirally dimpled connector
194b	parallel dimpled connector
194c	partial dimpled connector
194d	enhanced dimpled connector
195	dimple
195a–r	dimples
196	pin
198	deeper dimple
198a–b	deeper dimples
200	attaching belt
210	strap
220	tension means
230	attaching fastener
240	threaded receptor
300	curtain
302	anchored curtain
304	draw-curtain
306	enhanced draw-curtain
307	alternate curtain
307a	first alternate curtain
307b	second alternate curtain
308	window cover
309	windowed curtain
310	anchor point
312	edge hem
314	interior hem
316	grommet group
318	support hem
319	alternate support hem
320	see-through

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322	window
324	window grommet
340	tie
350	slit
352	slit cord
354	side grommet
356	pull loop
360	cord cutout
362	drawstring clip
364	drawstring
365	drawstring knot
366	drawstring fastener
367	reinforced hole
367a–d	reinforced holes
368	grommet
369	grommet reinforcement
370	first anchor point
380	second anchor point
390	third anchor point
395	hem segment
395a–c	hem segments
400	operator
410	path
510	hem reinforcement
520	fastening strap
530	hook and loop fastener
600	T-shaped support
605	cross bar
610	first ring end
620	second ring end
630	ring
640	curtain opening
700	straight connector
710	angled connector
720	reinforced angled connector
730	connector reinforcement
740	support with angled connector
750	shaft with angled connector
760	connected shaft
770	connector insert
780	top rail
782	bottom rail
784	rail ring
790	flexible connector
800	double support ring
810	segmented ring
820	curtained ring
900	supporting cord
910	hoop
915	overhead structure
920	eye fastener
925	knotted connector
930	connector with eye loop
935	eye loop
940	second cord
1010	first example
1020	second example
1025	friction pivot joint
1030	third example
1040	fourth example
1050	fifth example
1060	sixth example
1100	strap hole
1110	attaching material
1120	attaching hole
1130	tooth
1150	stopper
1300	case
1310	belt loop
1320	stake
1400	alternate cap
1402	tip
1404	rim

SPECIAL DEFINITIONS

cord—a flexible, and possibly elastic, filament including but not limited to a fiber, thread, string, rope, twine, wire, cable, yarn, thong, tendon, or line.

curtain—a concealing or protecting sheet of material.

grommet—a flexible loop that serves as a fastening, support, or reinforcement or an eyelet of firm material to strengthen or protect an opening or to insulate or protect something passed through it.

shaft—a supporting member in construction including but not limited to any solid or hollow, round or rectangular bar, beam, pole, rod, spar, or tube composed of wood, plastic, metal, or composite material.

telescoping shaft—an expandable and collapsible shaft having parts that slip over each other.

DESCRIPTION OF THE INVENTION

The present invention comprises an easy to use, simple, lightweight, compact, portable means of concealment and methods for its construction and use. The main components of the concealment means are a support and a curtain. The support attaches to a structure and pivots on the attachment. The present invention encompass various embodiments of the attaching pivoting support as well as various embodiments of curtains with various features. A method of the present invention allows for 360 degree concealment. In addition to a method of being fully enclosed, a method of the present invention is based on the concept of "hiding in front" of a similar pattern.

FIG. **1**A through FIG. **1**H

FIG. **1**A illustrates an attaching pivoting support **100**. The support **100** is bent at an angle. The bend **140** results in two legs: a first leg **150** and a second leg **160**. The first leg **150** has a threaded portion for threaded attachment to an attaching structure **130**, such as a tree, pole, rock, wall, or attaching fastener **230**. The bend **140** allows a user to exert a force on the second leg **160** that acts as a lever to screw the first leg **150** into the attaching structure **130**.

The angle of the bend **140** is shown as a 90 degree angle; however, good results have also been obtained by using an obtuse angle. An obtuse angle still provides a leveraged force but is less likely to cause the second leg **160** to be blocked by tree branches or other obstructions.

In this exemplary embodiment, a portion of the threaded portion of the first leg **150** is cylindrical, not tapered, so that once attached to the attaching structure **130**, the second leg **160** can be rotated up and down around the first leg **150** without loosing frictional force necessary to hold the attaching pivoting support **100** in the position the operator leaves it (as will be explained below).

The attaching pivoting support **100** can be constructed of a single shaft. However, depending on construction materials, a lighter embodiment can be constructed by combining various components. This invention anticipates that any combination of parts can be used to make the attaching pivoting support **100** with equivalent structural features and functions. Examples of some embodiments are shown in FIG. **1**B through FIG. **1**F.

FIG. **1**B shows an exploded view of the attaching pivoting support **100** comprised of a threaded support **102**, a threaded connector **104**, and a shaft **106**. The threaded connector **104** screws onto the threaded support **102** and is attached to the shaft **106**. Good results have been obtained by making the threaded support **102** from hardened steel, by making the

threaded connector **104** from an aluminum alloy tube, and by making the shaft **106** from fiberglass. Good attachment results have been obtained by gluing or crimping the aluminum tube to the fiberglass.

FIG. **1**C shows an assembled view of the example shown in FIG. **1**B.

FIG. **1**D shows an exploded view of the attaching pivoting support **100** comprised of a drilled support **120** and a drilled receiving shaft **122**. The drilled support **120** is inserted into a cavity in the drilled receiving shaft **122** and is held in place by a fastener **124**. Both the drilled support **120** and the drilled receiving shaft **122** are drilled to receive the fastener. The faster **124** could be a nail, screw, rivet, bolt and nut clasp, or similar means of attachment. Good results have been obtained by making the drilled support **120** from hardened steel and by making the drilled receiving shaft **122** from an aluminum alloy, plastic tube, or hollow fiberglass shaft.

FIG. **1**E shows an assembled view of the example shown in FIG. **1**D.

FIG. **1**F shows an embodiment of the attaching pivoting support **100** comprised of a plate **110** with a plate connection **112** for attaching the shaft **106**. The shaft **106** can be inserted through a plate sleeve **114** and attached by threads to the plate connection. The plate sleeve **114** provides added stability to the connection. The plate **110** is functionally equivalent to the bend **140** that connects the first leg **150** to the second leg **160**. Good results have been obtained by making the plate **110** from a high polymer plastic, and by making the shaft **106** from fiberglass. It may be desirable to make the first leg **150** with a large diameter and a short length.

Good results have also been obtained by attaching the threaded connector **104** to the shaft **106** as shown in FIG. **1**B and FIG. **1**C. Good attachment results have been obtained by gluing or crimping the aluminum tube to the fiberglass. Gluing the aluminum tube to the fiberglass creates a weld that distributes the force more evenly across the fiberglass shaft; this reduces the breakdown of the fiberglass that can shatter or fray when the forces are applied to a smaller area.

FIG. **1**G shows an embodiment of the attaching pivoting support **100** comprised of the threaded support **102**, the threaded connector **104**, and the shaft **106**. As in FIG. **1**B, the threaded connector **104** screws onto the threaded support **102** and is attached to the shaft **106**. However, in this embodiment the shaft **106** is comprised of a plurality of connected shafts **760** each connected to a connector. In this embodiment each connected shaft **760** is connected to a straight connector **700**. These form a segmented shaft **107**.

FIG. **1**G further shows an example where the shafts are hollow and connected with an elastic cord **126**. The elastic cord **126** running through the centers of the shaft **106** components (such as **100**, **700**, **710**, **720**, **740**, **750**, **760**, **770**, or **780**) can connect the components. This can prevent components from falling and makes it easier to assemble the shaft **106**.

FIG. **1**H shows an embodiment of the attaching pivoting support **100** comprised of the threaded support **102**, the threaded connector **104**, and the shaft **106**. As in FIG. **1**B, the threaded connector **104** screws onto the threaded support **102** and is attached to the shaft **106**. However, in this embodiment the shaft **106** is comprised of a telescoping shaft **108** comprising a plurality of concentric shafts that slide inside each other to extend for use and to collapse inside the outer shaft for storage. The telescoping shaft **108** could be one as known in the art, such as is commonly used for car or portable radio antennae, or one of a new design.

The free end of the shaft **106** can optionally be covered with a cap **170** that can protect the end of the shaft from breaking, protect the user, and make it easier to pass material over the end of the shaft **106**.

FIG. **1**I through FIG. **1**R

FIG. **1**I illustrates an alternate support **101** which is a embodiment of the attaching pivoting support **100**. The support **101** is comprised of three legs: a first leg **150**, an alternate second leg **192** and a third leg **190**. The first leg **150** has a threaded portion for threaded attachment to an attaching structure **130**, such as a tree, pole, rock, wall, or attaching fastener **230**. The alternate second leg **192** is an embodiment of second leg **160**, but has the same threaded portion as first leg **150**. In this embodiment either the first leg **150** or alternate second leg **192** can be attached to the attaching structure. The unused leg can be attached to a shaft **106** or connected shaft **760**. The bend **140** allows a user to exert a force on the alternate second leg **192** or the third leg **190** that act as a lever to screw the other leg into the attaching structure **130**. The third leg **190** is sharpened at one end. It is shown with a diagonal cut in this figure, but could have two diagonal cuts like a screw driver, four tetrahedral cuts like a nail or a tapered point like an awl, without departing from the spirit of the present invention. The sharpened end of the third leg **190** can be easily inserted into the ground. This allows the same alternate support to be used to form a ground blind as well as various tree blind configurations.

FIG. **1**J shows an exploded view of the attaching pivoting support **100** comprised of an alternate support **101**, a dimpled connector **194**, and a shaft **106**. The dimpled connector **194** receives either the first leg **150** or the alternate second leg **192**, and is attached to the shaft **106**. An improved permanent attachment can be made by inserting shaft **106** then subsequently dimpling the dimpled connector such that the dimples mechanically engage the shaft **106**.

FIG. **1**K shows an assembled view of the example shown in FIG. **1**J.

FIG. **1**L shows a leg either **150** or **192** being inserted into the dimpled connector **194**. In this figure the dimple connector **194** is shown with three dimples **195**.

FIG. **1**M an assembled view of the example shown in FIG. **1**L. The threads of the leg either **150** or **192** first engage the first dimple **195***a*, then the second dimple **195***b*, then the third dimple **195***c*. Good results have been found with three or more dimples.

FIG. **1**N through FIG. **1**P shows three embodiments of the dimpled connector **194**. In FIG. **1**N the dimples (**195***a* through **195***c*) form a single line. FIG. **1**O shows a spirally dimpled connector **194***a*. Where the dimples **195***d* through **195***f* form a first spiral and dimples **195***g* through **195***i* form a second spiral. FIG. **1**P a parallel dimple connector **194***b* where dimples **195***j* through **195***m* form a first line and dimples **195***n* through **195***q* for a parallel second line. One of ordinary skill in the art would understand that various dimpled arrangements could be used without departing from the spirit of the present invention.

FIG. **1**Q shows and embodiment similar to the one shown in FIG. **1**G where the dimpled connector **194** is connected to the shaft **106** with a elastic cord **126**. In this example, the partial dimpled connector **194***c* further comprises a pin **196** to which is attached a cord **126***a* with a cord attachment or knot **126***b*. An additional dimple **195***r* stops the end of shaft **106** from being inserted beyond the dimple **195***r*. This increases the reliability of the shaft **106** and the elastic cord **126**. For example, when the shaft is made from fiberglass, constant

hitting of the pin **196** or the cord attachment or knot **126***b* will cause premature fraying of the fiber glass.

FIG. **1**R shows and enhanced dimple connector **194***d*. This embodiment comprises the pin **196**, the cord **126***a*, the stopping dimple **195***r* as well as the thread receiving dimples **195***a* through **195***c*. It also comprises deeper dimples **198***a* and **198***b*. When the leg **150** or **192** is threadedly attached to the enhance dimpled connector **194***d*, the point of the leg will engage the deeper dimples and stop point of the leg from being inserted beyond the deeper dimples **198** where it could damage the cord attachment or knot **126***b*.

FIG. **2**A

FIG. **2**A shows a top cross-sectional view of the attaching pivoting support **100** attached to the attaching structure **130**. In this example the attaching structure **130** is shown as tree or a wooden pole. As will be shown later, the attaching structure **130** may comprise scaffolds, buildings, or devices composed of straps, belts, or other components further attached to trees or other structures.

In one normal use, the second leg **160** is extended generally horizontally. In this simplest embodiment of the present invention, the operator could drape a sheet, coat, poncho, garbage bag, tarp, or other available material over the attaching pivoting support **100** to form a means of concealment.

FIG. **2**B through FIG. **2**D

FIG. **2**B shows the attaching pivoting support **100**, as shown in FIG. **1**F, attached to the attaching structure **130** comprising an attaching belt **200**. The attaching belt **200** includes a strap **210** attached to an attaching fastener **230**. The attaching fastener **230** contains a threaded hole that is capable of receiving the threaded first leg **150**. The side of the plate **110**, which is adjacent to the first leg **150**, may be tapered so that the deeper it is threaded in the hole, the greater the friction between the plate **110** and the attaching fastener **230**.

The strap **210** could pass through openings on each end of the attaching fastener **230** (as shown in FIG. **11**A). Alternatively, the strap **210** can be permanently fastened to one end, passed around a tree or similar structure and then tightened against the structure by passing the loose end of the strap **210** through a tension means **220** on the opposite end. One embodiment of the tension means **220** is shown in FIG. **2**B. Other equivalent means are known in the art.

FIG. **2**C shows an exploded view of the attaching pivoting support **100** and the attaching belt **200** as shown and described in FIG. **2**B. The first leg **150** is not visible in this view but would attach at a threaded receptor **240** in the attaching fastener **230**.

FIG. **2**D shows a different view of same components shown and described in FIG. **2**B and FIG. **2**C. This view shows how the shaft **106** pivots around the center of the first leg **150** and the plate **110**. The shaft **106** is shown in a lowered position relative to the strap **210** which is shown horizontally as if it were attached to the attaching structure **130**, such as a tree or pole.

FIG. **3**A through FIG. **3**I

FIG. **3**A shows an embodiment of the present invention where a curtain **300** is hanging from the attaching pivoting support **100**. In this example, the curtain is a sheet of material with a support hem **318** sewn or sealed along the top edge. Good results have been obtained by making the curtain from camouflaged woven material or plastic sheeting. The attaching pivioting support **100** is passed through the support hem **318** of the curtain **300**.

FIG. **3**B shows an anchored curtain **302** which is an embodiment of the curtain **300** with multiple anchor points **310** and ties **340**. Each tie **340** can be used to adjust the effective length, or the effective shape, of the curtain by attaching to one of the anchor points **310**. The attaching points **310** and the ties **340** can hold the curtain **300** taut to avoid noise caused by wind.

A slit **350** can optionally be placed in the curtain **300** to allow the person to peak through the curtain **300** without lowering the attaching pivoting support **100**.

FIG. **3**C shows the detail of a row of anchor points **310**. In this example, there is a first anchor point **370**, as a second anchor point **380**, and a third anchor point **390**. Good results have been obtained by sewing a stretch cord into a hem such that the stretch cord forms the first and third anchor points (**370** and **390**) on the sides of the curtain, and the second anchor point **380** in between. The anchor points (**370**, **380**, and **390**) each are examples of a grommet **368** as used in the present invention.

A shaft could be placed through the anchor points **310** to make the curtain more rigid.

In an embodiment where more than one curtain **300** is used, the curtains can be tied together with the ties **340**, or a shaft could be inserted into adjacent anchor points **310**.

One method of using the present invention is to attach the attaching pivoting support **100** to a limb and position it vertically and attach the ties **340** to the tree trunk such that the curtain is held generally horizontally (see FIG. **4**E below).

Regardless of the position, the shaft **106** or second leg **160** of the attaching pivoting support **100** provides tension on the curtain **300** to hold it tight in the wind.

FIG. **3**D shows a draw-curtain **304**, which is an embodiment of the curtain **300** with one or more drawstrings **364**. In this exemplary embodiment, in addition to the support hem **318**, there is an edge hem **312** on each side of the curtain. Optionally, there could be one (as shown) or more interior hems **314** in the material between the edges. Each edge hem **312** or interior hem **314** forms a sleeve or path through which a drawstring **364** can pass. One end of the drawstring is attached to a drawstring fastener **366**. The drawstring fastener **366** could be a permanent attachment to the draw-curtain **304**. However, it is advantageous to have the drawstring fastener **366** be a moveable attachment, such as a hook or snap. A moveable version of the drawstring fastener **366** could be attached to one of a plurality of grommets **368** that can be placed in the curtain **300**. Each grommet could be a loop of flexible material (as shown in FIGS. **3**B and **3**C) or a firm eyelet (as shown in FIGS. **3**D, **3**E, **3**F, **3**H and **3**I). The other of end of the drawstring **364** is drawn in a loop that is passed through a drawstring clip **362**. The drawstring clip **362** prevents this end of the drawstring **364** from going through the respective hem (**312** or **314**). When the drawstring fastener **366** is attached to a grommet **368** above the bottom of the draw-curtain **304**, the material at the bottom of the curtain is drawn up shortening the effective length of the curtain. Typically, the drawstring fastener **366** end of the drawstring **364** is also passed around a fixed object, such as a tree branch, a tree trunk (as shown in FIG. **4**E below), a tree stand (as shown if FIG. **4**C below), or a stake **1320**. The extra length of the drawstring **364** can be drawn through the drawstring clip **362**. The tension between the fixed object at the drawstring fastener **366** end of the drawstring **364** and the drawstring clip **362** keeps that section of the drawstring **364** and the draw-curtain **304** taut. By securing each drawstring **364** as explained here, the length and shape of the draw-curtain **304** can be adjusted and the draw-curtain **304** is held tight so that its material is less likely to move or make noise in the wind. This layout makes it easier and safer to manipulate or adjust the curtain **300**. Being able to move the drawstring fastener **366** and adjust the length of the drawstring **364** using the

drawstring clip **362** without bending over and reaching all the way to the bottom of the curtain **300** is valuable when the user is high on a tree stand. The user can make adjustments while sitting or standing.

FIG. **3**D shows the interior hem **314** being shorter than the edge hem **312** teaching that technique can be used with the hem (**312** or **314**) only going up a portion of the curtain **300**. This could reduce the cost of the system and provide room for the slit **350** or a window **322**.

FIG. **3**D also shows an optional cord cutout **360** in the support hem **318**. This allows a supporting cord **900** to be attached to any shaft or connector passing through the support hem **318**. See FIGS. **9**A through **9**E below.

FIG. **3**E shows an enhanced draw-curtain **306**, which is an embodiment of the draw-curtain **304** with one or more extra grommets **368**. In this exemplary embodiment, in addition to the grommets near the edge hem, there is a grommet group **316** placed in the interior of the curtain **300**. When the drawstring fastener **366** is attached to one of the interior grommets **368** a sideways (lateral) force is added to the force that draws up the bottom of the curtain **300**. This sideways force can be used to change the shape of the curtain. The sideways force can be used to secure the curtain **300** around an object such as a tree or the base of the tree stand.

FIG. **3**E also shows the optional slit **350** in the enhanced draw-curtain **306**.

FIG. **3**F shows details of the edge hem **312**, drawstring clip **362**, drawstring **364**, drawstring fastener **366**, and grommets **368**.

FIG. **3**G shows details of the extra length of the drawstring **364** being looped through the drawstring clip **362**. A drawstring knot **365** keeps the end of the drawstring from passing through the drawstring clip **362**. The user can pull on the loop while opening the drawstring clip **362** to draw more of the drawstring **364** beyond the drawstring clip **362**. The user can relax the pressure on the loop while opening the drawstring clip **362** to release some of the drawstring **364** thus loosening or extending the draw-curtain **304**.

FIG. **3**H shows details of the interior hem **314**, drawstring clip **362**, drawstring **364**, drawstring fastener **366**, and grommets **368**.

FIG. **3**I shows the reinforced grommet group **316**. In some cases where the curtain **300** material is light, it may be beneficial to reinforce the material receiving the grommets with a strip of grommet reinforcement **369**

FIG. **3**K shows a windowed curtain **309**, which is an embodiment of the curtain **300** with one or more windows **322**. The window **322** is a geometric shape cut in the curtain **300**. The window can optionally be covered with a see-through **320**. The see-through **320** is material that a person near the window can see through but other people or wildlife, on the other side or at a distance, cannot see through. For hunting, the see-through **320** could also be material that could be shot through with an arrow, dart, or bullet. The window **322** could also be covered with a window cover **308**. As shown in detail in FIG. **3**J, the window cover **308** operates like an upside down version of the drawn-curtain **304**. The window cover has edge hems **312**, each providing a channel for drawstring **364**. The drawstring fastener **366** passes through a window grommet **324** at the top of the window **322** and then is attached to one of the grommets **368** near the edge hem **312**. The length of the window cover **308** can be adjusted by moving the drawstring fastener **366** to a different grommet **368** and tightening the drawstring **364** where it passes through the drawstring clip **362**.

FIG. **3**L shows an embodiment of the curtain **300** with the slit **350** being opened by a slit cord **352**. In this example, the slit cord **352** passes through a side grommet **354** which acts as a pulley to redirect the force when the slit cord **352** is pulled. The free end of slit cord **352** can optionally be tied to form a pull loop **356**. The operator can apply a force to the slit cord **352** by pulling directly on the slit cord **352** or optionally by placing the pull loop **356** around the operator's hand or foot. The force on the slit cord **352**, opens the slit **350** allowing the operator to see, or shoot, through the curtain **300** without moving the curtain **300**.

FIG. **3**M

FIG. **3**M shows an alternate curtain **307**, which is an embodiment of the curtain **300** with one or more drawstrings **364**. This embodiment is similar to the curtain shown in FIG. **3**D and FIG. **3**E. It contains optional slit **350**. However, unlike the draw curtain **304** and the enhance draw curtain **306**, this embodiment adds alternate support hem **319** (shown at the bottom). The alternate support hem **319** contains reinforced holes **367***a* through **367***d*. The reinforced holes **367** shown throughout this curtain are an embodiment of the grommet **368**. The reinforced holes **367** can be formed as conventional button holes where during sewing the button hole pattern can be made in the fabric and later cut. In this embodiment, the manufacturer of alternate curtain **307** requires fewer parts and tools than, for example, the use of metal grommets.

In this embodiment the use of the drawstrings **364** and the drawstring fasteners **366** is similar to that described above.

FIG. **4**A

FIG. **4**A shows an operator **400** concealed by the present invention. The operator **400** may be washing or taking care of other personal hygiene.

The means of concealment can quickly and quietly be lowered as shown by an angular path **410**. This allows the operator **400** to look over the curtain **300** or to shoot an arrow or fire a gun behind them without being obstructed by the means of concealment. After firing the user can quickly and quietly return the curtain **300** into its normal position as shown.

As explained earlier, one objective and advantage of the present invention is maintaining the frictional force of the first leg **150** with the attaching structure **130**. This frictional force holds the attaching pivoting support **100** in place when not being moved by the operator **400**. It should be clear that the operator **400** could also raise the curtain **300** so that the operator's head is also concealed.

FIG. **4**B and FIG. **4**C

FIG. **4**B shows a person observing wildlife from a tree stand without the benefit of the present invention. As explained earlier, the person makes a silhouette against the background and is observable from 360 degrees. FIG. **4**C shows the same person shielded by the present invention. In the method of present invention, first, the operator **400** attaches the attaching pivoting support **100** to the attaching structure **130** (in this example a tree). Next the operator **400** hides in front of the curtain **300**. This novel approach revolutionizes wildlife observation. It eliminates the silhouette of the operator **400**. It is believed that most animals see primarily black and white. This method removes one of the animals best sensing abilities. The approach allows the operator **400** to observe 180 degrees in front of him, or her, and to be free from worrying about what is in the 180 degrees behind him, or her. The operator **400** is free to eat, drink, modify clothing, etc. when it is clear to do so and hide for ½ of the observation area that is behind him, or her. The slit **350** can be placed in the curtain **300** (as shown in FIGS. **3**B, **3**E, and **3**L). The operator

400 can peek through the slit 350 to see if any wildlife is approaching; this can be done without moving the position of the second leg 160.

FIG. 4D shows an embodiment of the present invention where the curtain 300 is held in taut by two attaching pivoting supports 100: one at the top and one at the bottom. Either attaching pivoting support 100 can be moved independently. When the curtain 300 is taut, raising the top will cause both supports 100 to raise in parallel, and lowering the bottom will cause both supports 100 to lower in parallel.

FIG. 4E shows a use of the present invention where the attaching pivoting support 100 is attached to a horizontal structure 180, such as a tree limb or rafter, and positioned vertically. The ties 340 or the drawstrings 364 pass around a vertical object such as the tree trunk or a pole, so that the curtain 300 is held generally horizontally

FIG. 4F

FIG. 4F shows an example of the use of alternate support 101 as an attaching pivoting support 100. In this example, either first leg 150 or alter second leg 192 can be attached to the attaching structure 130 (shown as a tree). The curtain 300 can quickly and quietly be lowered in an angular path as described above in relation to FIG. 4*a*.

As explained earlier, an objective and advantage of the present invention is maintaining the frictional force. Either first leg 150 or alternate second leg 192 can be used to attach to the attaching structure 130.

FIG. 5A through FIG. 5C

FIG. 5A shows an embodiment of the present invention where the curtain 300 is held in its place simply by putting it over the exposed threads of the first leg 150. Good results have been found with a woven fabric catching on the threads and holding the curtain 300 in place.

FIG. 5B shows an embodiment of the present invention where the area of the curtain 300 that comes in contact with the exposed threads of the first leg 150 is reinforced for longer wear. A hem reinforcement 510 is made by using multiple layers of material.

FIG. 5C shows an embodiment of the present invention where the curtain 300 is held in place with a fastening strap 520 that connects over the first leg 150. Good results have been obtained by making the fastening strap 520 with a cord or loop of material. As shown in FIG. 5C the fastening strap 520 could also comprise a hook and loop fastener 530. The hook and loop fastener 530 is advantageous for quick assembly and disassembly.

The present invention anticipates that other similar means may be used to hold the curtain 300 in place.

FIG. 6A through FIG. 6D

FIG. 6A shows a major variation of the attaching pivoting support 100. A T-shaped support 600 comprises the first leg 150 attached to a cross bar 605. The cross bar 605 could be bent at an angle or curved. The user screws the T-shaped support 600 into the attaching structure 130 by rotating the cross bar 605.

FIG. 6B shows the T-shaped support 600 inserted into two ends of a ring 630 (not shown in FIG. 6B): a first ring end 610, on one leg of the cross bar 605, and a second ring end 620, on the opposite leg. Both ring ends have cavities for receiving the ends of the cross bar 605.

FIG. 6C shows the ring 630 extending from the attaching structure 130 supported by the T-shaped support 600. Good results have been obtained by making the T-shaped support 600 with hardened steel and making the ring 630 with a semi-rigid tube of plastic or a flexible shaft.

FIG. 6D shows the curtain 300 hanging from the ring 630. The edges of the curtain 300 form a curtain opening 640. The curtain opening 640 provides an entrance and exit. The curtain opening 640 further provides a viewing slit while the curtain maintains a backdrop to prevent an animal or person from seeing a silhouette. The curtain opening 640 provides a path for shooting film, arrows, and bullets.

FIG. 7A through FIG. 7G

It is anticipated by the present invention that the ring 630 could be made from multiple shafts connected permanently or temporarily by various connectors.

FIG. 7A shows the straight connector 700.

FIG. 7B shows an angled connector 710. The angle is obtuse.

FIG. 7C shows a reinforced angled connector 720. Tests have shown that the connector receives substantial force and, depending on the strength of the material, connector reinforcement 730 may be necessary.

Good results have been obtained by making these connectors with aluminum alloy tubes or plastic.

FIG. 7D shows a "support with angled connector" 740 comprising the attaching pivoting support 100 and a connector, either the angled connector 710 (shown), the straight connector 700, or the reinforced angled connector 720.

FIG. 7E shows a "shaft with angled connector" 750 comprising a connected shaft 760 and a connector: either the angled connector 710 (shown), the straight connector 700, or the reinforced angled connector 720.

FIG. 7F shows a connector with a connector insert 770. When the shaft 106 is inserted into a connector and a sideways (lateral) force is applied to the shaft 106, the material of the shaft 106 may breakdown. For example, a fiberglass shaft may break or fray. To avoid this problem, any shaft 106 can be protected by attaching the connector insert 770 to the end of the shaft 106. The connector insert 770 has a section, with smaller dimensions than the shaft receiving section, that can be inserted into a hollow connector such as the straight connector 700, the angled connector 710, the reinforced angled connector 720, or a flexible connector 790. The sideways (lateral) forces are transferred through the material of the connector insert 770. Good results have been obtained by making the connector insert 770 from metal or plastic and attaching it to the end of the shaft 106 with glue.

FIG. 7G shows an embodiment of the flexible connector 790. The flexible connector 790 allows the components that it connects to move side to side (laterally) but not up and down. The flexible connector can be comprised of a flexible top rail 780, a flexible bottom rail 782, and a plurality of rail rings 784. The top rail 780 and the bottom rail 782 allow the connector to flex side to side but resist up and down flexing. The rail rings 784 hold the rails together and act as receivers for the shafts 106 or narrow sections of the connector inserts 770. The rail rings 784 also limit the amount of side to side flexing.

FIG. 8A through FIG. 8E

FIG. 8A shows a double support ring 800, namely, two of the attaching pivoting supports 100 attached to the same attaching structure 130, the respective second leg 160 of each support being connected with a connector: such as the straight connector 700 (shown), the angled connector 710, the reinforced angled connector 720, or similar connector.

FIG. 8B shows a substantially similar structure, a segmented ring 810 comprising one "support with angled connector" 740 (as shown and explained with FIG. 7D), multiple "shafts with angled connectors" 750, and one attaching pivoting support 100.

Both the double support ring **800** and the segmented ring **810** shown in FIG. **8**A and FIG. **8**B, respectively, can pivot up and down by virtue of the pivoting of each first leg **150**. The present invention anticipates that substantially similar pivoting support structures could be constructed of with any number of supports, shafts, and connectors.

FIG. **8**C shows a curtained ring **820** comprised of either the double support ring **800** or the segmented ring **810** and one or more curtain(s) **300**. The curtained ring **820** is attached to the attaching structure **130**.

FIG. **8**D shows variation of the segmented ring **810** (shown in FIG. **8**B) comprising one "support with angled connector" **740** (as shown and explained with FIG. **7**D), multiple "shafts with angled connectors" **750**, and one attaching pivoting support **100**. However, in this embodiment, the attaching pivoting support **100** and the angled connector **740** have obtuse angles. As explained before, the obtuse angles help avoid obstructions when attaching. This embodiment has the added advantage of excluding the attaching structure **130** from the concealed area, thus allowing more room for the user.

The elastic cord **126** running through the centers of a group of ring or hoop components (such as **100**, **700**, **710**, **720**. **740**, **750**, **760**, **770**, or **790**) can connect the components. This can prevent components from falling and makes it easier to assemble the rings **360**, **800**, **810**, **820** or hoop **910**.

FIG. **8**E shows an alternate embodiment of the segmented ring **810** where two attaching pivoting support attach to the attaching structure **130**. The remaining components of the segmented ring **810** comprise a plurality of angled connectors **710**, connected shafts **760**, straight connectors **700**, and connector inserts **770**, all connected together by the elastic cord **126**.

FIG. **9**A through FIG. **9**E

FIG. **9**A shows the supporting cord **900** supporting a hoop **910**. The hoop **910** represents either the attaching pivoting support **100**, the ring **630** (shown in FIG. **6**C and FIG. **6**D), the double support ring **800** (shown in FIG. **8**A), the segmented ring **810** (shown in FIG. **8**B, FIG. **8**C and FIG. **8**D), or an equivalent structure. In the example shown in FIG. **9**A the supporting cord **900** is attached to an overhead structure **915**, such as a tree limb, a scaffold, or other overhead element.

FIG. **9**B shows the supporting cord **900** attached to an eye fastener **920**. In the example shown in FIG. **9**B the eye fastener **920** is screwed into the attaching structure **130** at a point higher than the hoop **910** is attached.

FIG. **9**C shows a knotted connector **925**. The supporting cord **900** is tied around a connector. Good results have been obtained by tying a lark's head knot over the angled connector **710** as shown. The present invention anticipates that other knots, for example two half hitches, clove hitch, timber hitch, bow line, taut line, bow knot, slip knot, and the like could be substituted. The present invention anticipates that such knots could be tied anywhere on the hoop **910** as shown in FIG. **9**A and FIG. **9**B.

FIG. **9**D shows a connector with eye loop **930**. The supporting cord **900** passes through an eye loop **935** comprising part of the connector.

FIG. **9**E shows the section of the segmented ring **810** shown is FIG. **8**E being supported by the supporting cord **900** and a second cord **940**. The second cord **940** is tied around the connected shaft **760** next to the angled connector **710** at one end and around the connected shaft **760** next to the connector insert **770** at the other end. The second cord **940** distributes the force from the supporting cord **900** to the segment ring **810** at two points. The raised edges of the angled connector **710** and the connector insert **770** prevent the second cord **940** from slipping inward. Because the second cord **940** connects the two components, the elastic cord **126** between them is redundant and could be eliminated.

In these embodiments one or more cords **900** help support the weight of the hoop **910** and the curtain **300** (not shown) so that the hoop **910** and its components can be of lighter weight and support a heavier load.

FIG. **10**A through FIG. **10**F

A number of tree steps are known in the art. The present invention anticipates that the attaching pivoting support **100** could attach to an attaching structure **130** comprising an improved tree step and pivot about its connection to the tree step at a friction pivot joint **1025**. FIG. **10**A through FIG. **10**F show various embodiments of the attaching pivoting support **100** in combination with various tree steps. In each example, the attaching structure **130** includes an improved tree step. It should be anticipated that any tree step could be used in a similar manner in the present invention.

FIG. **10**A shows a first example **1010** where an embodiment of the present invention which is formed by additional bends in the attaching pivoting support **100**. A similar but not equivalent tree step based device with three or more legs is show in U.S. Pat. No. 5,908,084, entitled "Lifting and raising device", however, the present invention is not described or claimed by Laurin et al.

FIG. **10**B shows a second example **1020** where the attaching pivoting support **100** is combined with the tree step shown in U.S. Pat. No. 5,279,388, entitled "Tree climber or step device", however, the present invention is not described or claimed by Laughlin et al.

FIG. **10**C shows a third example **1030** where the attaching pivoting support **100** is combined with the tree step shown in U.S. Pat. No. 4,867,272, entitled "Steps for climbing trees", however, the present invention is not described or claimed by Troubridge.

FIG. **10**D shows a fourth example **1040** where the attaching pivoting support **100** is combined with the tree step shown in U.S. Pat. No. 4,000,788, entitled "Belt-on tree step (BOTS)", however, the present invention is not described or claimed by Burgess et al.

FIG. **10**E shows a fifth example **1050** where the attaching pivoting support **100** is combined with a component of the tree step shown in U.S. Pat. No. 4,775,030, entitled "Tree step", however, the present invention is not described or claimed by Wright.

FIG. **10**F shows a sixth example **1060** where the attaching pivoting support **100** is combined with the tree step shown in U.S. Pat. No. 4,697,669, entitled "Folding portable tree step", however, the present invention is not described or claimed by Bergsten.

FIG. **11**A

FIG. **11**A shows the attaching pivoting support **100**, in the embodiment shown in FIG. **1**F and FIG. **2**B, connected to the attaching belt **200**. In this embodiment the strap **210** passes through holes in each end of, and under, the attaching fastener **230**. This embodiment shows the use of the threaded connector **104** for attaching the shaft **106** to the plate connection **112**. The shaft **106** passes through the plate sleeve **114** for added support. The attaching pivoting support may be rotated around the pivot point along the path **410** (as is show in FIG. **4**A). The friction between the plate **110** and the attaching fastener **230** holds the device in position.

FIG. **11**B

FIG. **11**B shows a simple embodiment where the attaching pivoting support **100** passes through the strap **210** via two

strap holes **1100**. The tension of the strap **210** against the attaching structure **130** holds the attaching pivoting support **100** in place. The attaching pivoting support **100** can be bent at an angle and pivot in the strap holes **1100**.

FIG. **11**C

FIG. **11**C shows an embodiment where the attaching pivoting support **100** connects to the attaching structure **130** comprising the strap **210** and the attaching fastener **230**. The attaching fastener **230** provides the friction pivot joint **1025** with the first leg **150**. The friction pivot joint **1025** comprises attaching material **1110**, attached to the attaching fastener **230**, and having a threaded attaching hole **1120**. An optional tooth **1130** on the back of the attaching fastener **230** provides torque resistance.

Good results have been found making the attaching fastener **230** of metal and the attaching material **1110** of a high polymer plastic as known in the art.

FIG. **11**D

FIG. **11**D shows an alternate embodiment of the attaching fastener **230**. In this embodiment torque resistance is provided by the strap **210**.

FIG. **11**E

FIG. **11**E shows an alternate embodiment strap **210** with more than two strap holes **1100**. In this embodiment the attaching pivoting support **100** can pass through any two or more of the strap holes **1100**. For example, if the strap **210** is attached to a small diameter tree, then the attaching pivoting support **100** could be passed through strap holes **1100** that are close to each other. On the other hand if the strap **210** is attached to a large diameter tree it may be necessary to pass the attaching pivoting support **100** through strap holes **1100** that are farther from each other to apply the necessary friction.

FIG. **11**F

FIG. **11**F shows an embodiment where one end of the shaft **106** of the attaching pivoting support **100** has a enlarged end that acts as a stopper **1150** to prevent it from passing through the strap holes **1110**.

FIG. **11**G and FIG. **11**H

FIG. **11**G and FIG. **11**H show embodiments where the alternate support **101** connects to the attaching fastener **230**. As described above the attaching fastener **230** provides the friction pivot joint **1025** with the first leg **150** (FIG. **11**H) or alternate second leg **192** (FIG. **11**G).

In FIG. **11**G, where the alternate second leg **192** is used to attach to attaching structure **130** the third leg **190** can be used to hang equipment such as a bow, quiver or water bottle.

In FIG. **11**H, where the first leg **150** is used to attach to attaching structure **130** the third leg **190** can be used as a lever to assist in driving the alternate support **101** into the attaching structure **130**. The third leg **190** can also be used as a lever to raise and lower the curtain **300**.

FIG. **12**

FIG. **12** shows an alternate embodiment of the present invention where the attaching pivoting support **100** comprises the shaft **106** that passes under the strap **210**. In this embodiment the pressure and friction of the strap **210** is sufficient to attach and to provide a pivot point for the attaching pivoting support **100**. The curtain **300** is supported by the attaching pivoting support **100**.

FIG. **13**

FIG. **13** shows a light weight, portable embodiment of the present invention, known as the Pocket UnBlind. FIG. **13** shows a folded curtain **300**; a collapsed attaching pivoting support **100** (shown disassembled into two separate pieces) comprised of the threaded support **102** (as shown, or alternatively, the alternate support **101**—not shown) and the segmented shaft **107** with cap **170** held together by the elastic cord **126**; a plurality of stakes **1320**; and a carrying case **1300**. The case **1300**, which can hold all of the other components, is shown with a belt loop **1310**, which makes it easy to carry. The case is closed with the drawstring **364**, which can be held closed with a knot or the drawstring clip **362**. Each stake **1320** can be put in the ground, tree, or other substance to make a fixed object to which the ties **340** or drawstrings **364** of the curtain **300** can be attached. With the stakes, the same blind can be used, for example, in a tree stand for hunting deer in the fall and on the ground for hunting turkey in the spring.

FIG. **14**A and FIG. **14**B

FIG. **14**A and FIG. **14**B show ground blind embodiments.

FIG. **14**A shows the use of three alternate supports **101** and two alternate curtains **307** to form a ground blind. In this example, the alternate second leg **192** of each alternate support **101** is inserted into the ground. Each alternate support **101** is connected to a shaft **106** using either a threaded connector **104** or one of the embodiments of a dimpled connector **194**. The alternate support hems **319** of both a first alternate curtain **307***a* and a second alternate curtain **307***b* are placed over the center of alternate support **101**. The support hem **318** of the first alternate curtain **307***a* is placed over the shaft of the alternate support **101** on the left. The support hem **318** of the first alternate curtain **307***b* is placed over the shaft of the alternate support **101** on the right. The alternate supports **101** can be placed in a line to form wall or diagonally to form a V-shaped blind.

Three or more curtains could be used to form a full enclosed blind.

FIG. **14**B shows an embodiment with more of the optional curtain features, such as, drawstrings **364** and the use of the reinforced holes **367***a* through **367***d* to create an interwoven connection between two alternate curtains **307**.

FIG. **14**C through FIG. **14**H

FIG. **14**C though FIG. **14**G shows details of the ground blind embodiments.

FIG. **14**C shows an embodiment where the third leg **190** has been inserted into the ground. The alternate second leg **192** has been attached to a shaft **106** or connected shaft **760** using a dimpled connector. In this example, the first leg **150** can be used to assert downward force on the alternate support **101** using a foot to drive the third leg **190** into rocky or frozen soil.

FIG. **14**D illustrates an embodiment where two curtains **300** are joined over a shaft **106** (or **760**) using hem segments **395***a* through **395***c*. In this example, hem segments **395***a* and **395***c* are part of the curtain **300** on the right and hem segment **395***b* is part of another curtain **300** on the left. The curtains are joined by alternately passing the shaft **106** through the hem segments: first **395***a*, then **395***b*, then **395***c* and so forth. FIG. **14**D also shows an alternate cap **1400**.

FIG. **14**E shows the preferred embodiment of joining alternate curtains **307** which works on a similar principle. The first alternate curtain **307***a* and the second alternate curtain **307***b* are joined by passing the shaft **106** through the alternate support hem **319** of each curtain. At each of the reinforced holes **367***a* through **367***d*, the rod passes out of the hem of one curtain and into the hem of the other curtain. For example, the shaft would enter through **307***a* and then into the hem of curtain **307***b* at reinforced hole **367***d*. It would exit **307***b* at **367***c* and at that point enter **307***a*'s hem at **367***b*. It would

continue along the alternate support hem **319** where it would exit **307***a* at **367***c* and reenter **307***b* at **367***b* where it would continue through the hem **319** of **307***b* until is exited at **367***a* and would finally pass through the final reinforced hole **367***d* of **307***a*. At that point both alternate curtains **307** would be secured by the alternate cap **1400**. The advantage of this arrangement is that it forms a tight connection that prevents light and wind from passing between the two curtains. This novel alternate support hem **319** also has the advantage of being easy to secure over a shaft by itself or interwoven as described above. This is in contrast to the embodiment shown in FIG. **14**D where the shaft has to be placed through multiple hem segments **395**.

FIG. **14**F shows the detail of the alternate cap **1400** which is similar in design to the connector insert **770**. The tip **1402** has a narrow diameter and the rim **1404** has a wider diameter. As shown in FIG. **14**G, when inserted through the first alternate curtain **307***a* and the second alternate curtain **307***b* the tip **1402** can pass through reinforced holes **367***d* of **307***a* and **367***a* of **307***b* (as described above). The rim **1404** portion of the alternate cap **1400** holds both curtains in place while under tension, but easily allows the curtains to be slipped off to break down the blind.

FIG. **14**H shows a pivoting ground bind comprised of two alternate supports **101** connected to opposite ends of a first shaft **106** (hidden by the curtain edge hem **312**). The top alternate support **101** is also connected to a second shaft **106**, which supports a curtain via support hem **318**. When the third leg **190** is inserted into the ground, it can pivot freely in any direction. Thus, the shaft supporting curtain **300** can be pivoted anywhere in a horizontal plane.

ADVANTAGES

Simple

The present invention is simple to make and use. It contains fewer components than other devices in the field of this invention. Each component is easily made. The present invention requires little time to attach and to set up.

Easy to Use

The present invention is easy to use. To install, the operator **400** simply attaches the support and optional shafts, connectors, or curtains. To use, the support is raised or lowered.

Light Weight

The present invention comprises a few simple parts that can easily be constructed of lightweight materials. Being lightweight is important for those who have to carry gear into the outdoors.

Compact

The present invention is compact. The support, shafts, connectors, and curtains can easily be rolled together into a small bundle or placed in a slender sack such as the case **1300**. This is advantageous for both storage and carrying.

Portable

The present invention is lightweight and compact allowing it to be carried long distances into the outdoors and to be used in a variety of locations. The curtain **300** can be folded or rolled up with various components of the attaching pivoting support **100** and placed in the case **1300** for easily carrying on a waist belt or in a backpack.

Quiet

The present invention has no moving parts that would make a noise or rattle together. In some cases the screws turning against the attaching structure could make a quiet sound. However the design is such that once screwed in all the way the screw can be backed out a turn or two to reduce the volume of noise made to a negligible level.

Further, the tension on the curtain **300** provided by the second leg **160** and the anchor points **310** and ties **340** reduce wind noise.

Universal

The present invention uses the same three legged support **101** to construct both a variety of tree blinds and ground blinds. The same parts and equipment can be used to construct blinds of for different purposes and for different environments. This maximizes the user's investment in the materials and minimizes the number of items to be packed.

Lower Cost, Longer Reliability

The present invention provides a number of novel features that reduce the complexity and cost of manufacture and that increase the reliability of the parts.

CONCLUSION, RAMIFICATION, AND SCOPE

Accordingly, the reader will see that the present invention provides an easy to use, simple, lightweight, compact, portable, quiet, multi-use means of concealment and methods for its construction and use.

While my above descriptions contain several specifics these should not be construed as limitations on the scope of the invention, but rather as examples of some of the preferred embodiments thereof. Many other variations are possible. For example, other embodiments of a means of concealment include various construction materials, multiple cords or shafts or connections.

Accordingly, the scope of the invention should be determined not by the embodiments illustrated, but by the appended claims and their legal equivalents.

I claim:

1. A system of concealment comprising:

a) at least three attaching supports, each attaching support for supporting a curtain comprising a first leg and a second leg and a third leg,

wherein said first leg is orthogonally joined to said second and third legs,

wherein said first leg and said second leg are threaded with substantially similar threads whereby at least one of said first and said second legs is attached to a shaft using a connector,

wherein said third leg is smooth and sharpened at the end, and

wherein one of the other of said legs is attached to an attaching structure or the ground,

whereby said shaft can support a curtain,

b) at least three of said shafts, and

a) at least two of said curtains,

wherein a first hem of a first of said curtains is supported by a first of said attaching supports,

wherein a second hem of said first curtain and a third hem of a second of said curtains is supported by a second of said attaching supports,

wherein a fourth hem of said second curtain is supported by a third of said attaching supports,

wherein said third legs of each of said attaching supports is inserted into said ground,

wherein said second hem and said third hem each comprise a plurality of reinforced holes, and

wherein said first and second curtains are joined by running said shaft of said second attaching support through said reinforced holes,

whereby a ground blind is formed.

2. A system of concealment comprising:

a) at least three attaching supports, each attaching support for supporting a curtain comprising a first leg and a second leg and a third leg,

wherein said first leg is orthogonally joined to said second and third legs,

wherein said first leg and said second leg are threaded with substantially similar threads whereby at least one of said first and said second legs is attached to a shaft using a connector,

wherein said third leg is smooth and sharpened at the end, and

wherein one of the other of said legs is attached to an attaching structure or the ground,

whereby said shaft can support a curtain,

b) at least three of said shafts, and

c) at least two of said curtains,

wherein a first hem of a first of said curtains is supported by a first of said attaching supports,

wherein a second hem of said first curtain and a third hem of a second of said curtains is supported by a second of said attaching supports,

wherein a fourth hem of said second curtain is supported by a third of said attaching supports,

wherein said third legs of each of said attaching supports is inserted into said ground,

wherein said second hem and said third hem are passed over at least a portion of said shaft of said second attaching support,

wherein said shaft further comprises a cap comprising a tip and a rim,

wherein said second hem comprises at least one reinforced hole near the corner of said first curtain and wherein said third hem comprises at least one reinforced hole near the corner of said second curtain, and

wherein said tip of said cap pass through both of said reinforced holes and hold up the corners of both of said curtains,

whereby a ground blind is formed.

3. The system of concealment of claim **1**,

wherein said shaft further comprises a cap comprising a tip and a rim,

wherein said second hem comprises at least one reinforced hole near the corner of said first curtain and wherein said third hem comprises at least one reinforced hole near the corner of said second curtain, and

wherein said tip of said cap pass through both of said reinforced holes and hold up the corners of both of said curtains.

4. The system of concealment of claim **1**,

wherein said shaft is attached with a threaded connector.

5. The system of concealment of claim **1**,

wherein said shaft is attached with a connector,

wherein said connector is a dimpled connector wherein a plurality of dimples engage a plurality of threads of a leg on the attaching support.

6. The system of concealment of claim **1**,

wherein a third of said curtains is supported by the first attaching support on one end and by the third attaching support on the other end,

wherein a three-sided ground blind is formed.

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